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THE CAUSES OF INTER-STATE MIGRATION[1]

E. L. Thorndike
Teachers College, Columbia University

Editor's Note

The problems of internal migration have recently engaged the attention of a number of distinguished scholars. Sociometry published in February a contribution to this subject by Professor John Q. Stuart of Princeton University ("A Measure of the Influence of a Population at a Distance," Sociometry, 1942, 5:63-71). Two other notable contributions to the subject should be mentioned because of their relationship to the present article: S. A. Stouffer, "Intervening Opportunities: A Theory Relating Mobility and Distance," Amer. Sociol. Rev., 1940, 5:845-867; Dorothy S. Thomas, "Interstate Migration and Intervening Opportunities," Amer. Sociol. Rev., 1941, 6:773-783. The present article is by a distinguished psychologist and a former president of the American Association for the Advancement of Science.

The mobility of the American people is and has been very great. In 1930, 27 percent of the native white population were living outside of the state where they were born. In 1900, 21 percent were. In 1880, 25 percent were.

Valuable information has been given concerning these movements and their results in the Census from time to

---

[1]This article is an abbreviation of a monograph entitled Inter-state Migration and Its Causes, which may never be published. The monograph included much descriptive material, and many instructive partial and multiple correlations. But all the important conclusions about causation are here retained, and Tables 2 and 3 present the essential basic correlations. I take this occasion to acknowledge the financial assistance of the Carnegie Corporation which made the work possible.

Certain fundamental tables and tables of partial and multiple correlations, which are important for special students of inter-state migration and formed the bulk of the larger manuscript, may be secured in bibliofilm from the American Documentation Institute, Offices of Science Service, 2101 Constitution Avenue, Washington, D. C.

time.[2] But a more thorough description and analysis can be made by using 1128 sets of facts for the 1128 pairs of states, and putting the facts for each pair into two ratios which are related to the attractive force exerted by one state upon the population of the other. For example, using the native white of native parentage, we find that in 1930, 70,529 born in Maine were residing in Massachusetts, and 16,585 born in Massachusetts were residing in Maine. The ratios

$$\frac{\text{Born in Maine residing in Massachusetts}}{\text{Born in Massachusetts residing in Maine}}, \text{ which is 4.25 and}$$

$$\frac{\text{Born in Massachusetts residing in Maine}}{\text{Born in Maine residing in Massachusetts}}, \text{ which is .23 1/2,}$$

are rough measures of the relative attractive forces of Massachusetts and Maine upon each other's natives.

I have computed such ratios for seven groups:

All native-born whites in 1870
All native-born whites in 1900
All native-born whites of native-born parents in 1930
All native-born whites of foreign-born parents in 1930
All native-born colored in 1870
All native-born colored in 1900
All native-born Negros in 1930

In what follows I use only those ratios in which the number of persons involved was at least ten, or the ratio was 6/0, 7/0, 8/0, 9/0, 0/6, 0/7, 0/8, or 0/9. The facts for the two Virginias, the two Dakotas and Oklahoma can only be estimated for 1870, and there are some of the 1128 pairs for some groups at some periods in which the ratio was 0/0 or of numbers too small to deserve much consideration.

Table I presents a few samples of the thousands of ratios used. Superior attractiveness and other similar terms always refer to these I M ratios.

I have also for each pair of states eighteen measures of the difference between the two states in:

[2] See especially the report by Dr. Joseph A. Hill in the Volume of Supplementary Analysis of the Twelfth Census (1900), pages 276-328, and pages 83-118 of The Problems of a Changing Population, a report to the National Resources Committee of its Committee on Population Problems (1938).

Table I

The I M ratio, $\frac{\text{Born in B, living in A}}{\text{Born in A, living in B}}$, for various pairs of states for the specified groups at the specified dates.

		Native whites				Native colored or Negro		
A	B	All 1870	All 1900	Nat. Par. 1930	For.or Mixed Par. 1930	Na. Col. 1870	Na. Col. 1900	Negro 1930
Mass.	N. Y.	.59	1.57	.83	.64	2.02	1.45	.30
"	Ill.	.04	.28	.59	.35	.22	.42	.35
"	Iowa	.03	.26	1.41	.76	.00	1.30	1.11
"	Cal.	.29	.09	.07	.04	.04	4.20	.17
"	Fla.	.13	.32	.14	.09	3.10	4.26	4.24
"	Tex.	.12	.29	.47	.22	.05	.49	2.34
N. Y.	Ill.	.03	.15	.75	.47	.08	.28	1.72
N. Y.	Iowa	.01	.08	1.06	.64	.02	1.08	5.75
N. Y.	Cal.	.03	.08	.10	.08	.01	1.85	.56
N. Y.	Fla.	.26	.30	.24	.25	1.63	7.55	27.27
N. Y.	Tex.	.08	.21	.81	.42	.21	1.05	21.61
Ill.	Iowa	.19	.34	1.04	.79	.56	1.04	2.48
"	Cal.	.08	.08	.04	.04	.17	.70	.28
"	Fla.	1.30	.26	.14	.13	5.50	4.08	11.51
"	Tex.	.16	.13	.31	.38	.87	1.71	20.91
Iowa	Cal.	.09	.05	.01	.01	.17	.48	.06
"	Fla.	2.89	.20	.06	.04		11.00	6.38
"	Tex.	.42	.15	.15	.11	2.00	1.25	5.51
Cal.	Fla.	39.67	3.03	3.49	2.95	15.00	2.83	9.11
"	Tex.	11.96	4.01	15.23	9.17	4.00	7.64	80.41
Fla.	Tex.	.04	.26	.86	1.07	.02	.17	1.05

1. latitude north
2. longitude west
3. area
4. "thinness" (density reversed) of population in 1860
5. " " " " " " 1880
6. " " " " " " 1900
7. " " " " " " 1920

Measures 4, 5, 6, and 7 are differences in the number of persons per square mile, with signs reversed.

8. cityness in 1900, a score computed from 4 x (the percentage of the population in cities of 100,000 or over) + 2 x (the percentage of the population in cities of 25,000 to 99,999) + 1 x (the percentage of the population in cities of 8,000 to 24,999). The score runs from 0 for some states to 242 for New York, but is turned into scale values from 0 to 25 as shown in the note below, before the differences between each pair of states are computed:
0 = 0, 2-3 = 1, 4-6 = 2, 7-9 = 3, 10-14 = 4, 15-19 = 5, 20-24 = 6, 25-29 = 7, 30-34 = 8, 35-39 = 9, 40-44 = 10, 45-54 = 11, 55-64 = 12, 65-74 = 13, 75-84 = 14, 85-94 = 15, 95-104 = 16, 105-115 = 17, 115-129 = 18, 130-144 = 19, 145-159 = 20, 160-174 = 21, 175-189 = 22, 190-204 = 23, 205-224 = 24, 225-244 = 25.
9. cityness in 1930, a score computed in the same manner as cityness in 1900 except that cities of 10,000 to 24,999 replace cities of 8,000 to 24,999, and that the scale for transmuting the scores is different as shown below:
0-9 = 0, 10-19 = 2, 20-29 = 3, 30-39 = 4, 40-49 = 5, 50-59 = 6, 60-69 = 7, 70-79 = 8. 80-89 = 9, 90-99 = 10, 100-109 = 11, 110-119 = 12, 120-129 = 13, 130-139 = 14, 140-159 = 15, 160-179 = 16, 180-199 = 17, 200-219 = 18, 220-249 = 19, 250-289 = 20.

10. percentage of colored in 1900
11. " " " " 1930
12. "manufacturingness," or the importance of manufacturing relative to farming, measured by dividing the value added by manufacturing done in the state in 1930 by the value of farm property in the state in 1930. This gives quotients running from about .01 for North and South Dakota to over 5.00 for Massachusetts and Rhode Island. I score them from -8 to +8 in an approximate geometrical progression in which

.010	to	.015	= -8
.016	to	.023	= -7
.024	to	.035	= -6
.036	to	.053	= -5
.054	to	.079	= -4
.08	to	.11	= -3
.12	to	.17	= -2
.18	to	.26	= -1
.27	to	.40	= 0

.41	to	.60	= +1
.61	to	.90	= +2
.91	to	1.35	= +3
1.36	to	2.03	= +4
2.04	to	3.05	= +5
3.06	to	4.58	= +6
4.59	to	6.89	= +7
6.90	to	10.34	= +8

13. native white literacy in 1900 (percentage of native-born whites aged 10 or over who were literate).
14. the Bagley modification of the Ayres index of the quantity and quality of education provided in 1900.
15. a composite measure called GP consisting of the percentage of children 5 to 18 enrolled in public schools, the expense per pupil per year for teachers' salaries, the expense per pupil per year for other costs, the number of days public schools were in session, the native white literacy, and the reversed death rate for children under 5, all for 1900.
16. a composite measure (G) of the general goodness of life for good people, for 1930, computed from 37 items such as the frequency of education of persons 18 to 20 years old, the frequency of radios, the infrequency of infant mortality, the infrequency of deaths from typhoid, and the per capita expenditures for libraries.[3]
17. a composite measure (P) of certain personal qualities of the population, for 1930, computed from items such as the frequency of literacy, the frequency of home ownership, and the infrequency of deaths from homicide.[3]
18. an index of (I) of per capita income in 1930 computed from nine items such as the number of income tax returns, the average wage of factory employees, and the per capita food-store sales.[3]

These eighteen measures of the differences between one state of a pair and the other are used in investigating the affiliations and causes of the IM (inter-state migration) ratios.

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[3]Measures 16, 17, and 18 are described in detail on pp. 236-240 of American Cities and States: Variation and Correlation in Institutions, Activities and Personal Qualities of the Residents, Vol. XXXIX of the Annals of the New York Academy of Sciences, 1939, by E. L. Thorndike. They are practically identical with the G, I and P indices described in Your City (by the same author).

Table 2 reports the correlations between IM (the inter-state migration ratio) and the various measures of difference between the two states in G, I, P, latitude, longitude, etc. The correlations of Table 2 for area indicate the importance of differences between two states in area and whatever differences in area involve, in accounting for superiority in attractive power as measured by the migration ratio. Similarly for latitude, longitude, and all the others. For example, the fractions of the variation in the IM ratios for native whites in 1870 accounted for by area and what area involves and by longitude and what longitude involves were respectively .77 and .94 (the fraction accounted for being the square of the correlation). The reason why we obtain a total apparently accounting for 171 percent of the differences in attractive power is that differences in area and differences in longitude involve in part the same things, as is proved by the fact that they themselves correlate .91.

The affiliations of IM with the eighteen measures presented in Table 2 thus may, and in fact do, require consideration of the intercorrelations of the eighteen measures themselves, in order to progress from affiliation to determination or causation. These intercorrelations, so far as they are needed in the present report, are presented in Table 3. Table 3 reports various intercorrelations among the measures of difference in the 1128 pairs of states, and also in the 990 pairs used for 1870 whites, in the 633 pairs used for 1870 colored, and in the 854 pairs used for 1900 colored, and in the 903 pairs used for 1930 negroes.

The causation of the differences between states in attractiveness, that is of the variation in the IM ratios, may be considered as the independent contributions of all of our difference measures, plus the contributions of factors which are common to two or more of them, plus factors not measured by any of our difference measures. For example, it is the fact that (assuming the accuracy of the correlations of Tables 2 and 3) the IM ratios for Negroes alive in 1930 are accounted for (or "determined," or, in the common-sense meaning of the word, "caused") as follows:

.03 1/2 by what is measured by G and not by I or longitude
.52 " " " " " I " " " G " longitude
.08 " " " " " longitude and not by G or I
.25 " " " common to G and I
.02 " " " " " G and longitude
.03 " " " " " I and longitude
.06 1/2 by factors not measured by G, I, or longitude

Table 2

The correlations between the inter-state migration ratio of a pair of states and certain measures of difference between the two states. 1128 pairs of states are used for the 1930 whites and for the 1900 whites; 990 pairs are used for the 1870 whites; 633 pairs are used for the 1870 colored; 854 pairs are used for the 1900 colored; 903 pairs are used for the 1930 colored.

	Native Whites				Native Colored or Negro		
	1870	1900	Native Par. 1930	For. or M. Par. 1930	Col. 1870	Col. 1900	Neg. 1930
Latitude N	.07	-.04	.12	-.25	.50	.54	.70
Longitude W	.97	.90	.75	.80	.71	.53	.36
Area	.88	.79	.65	.74	.63	.46	.27
Density of population reversed 1860	.91				.61		
Density of population reversed 1880		.81				.38	
Density of population reversed 1900		.78	.56	.70			
Density of population reversed 1920			.49	.64			.07
Cityness 1900	-.39	-.33	-.05	-.36	.05	.20	.49
Cityness 1930	-.23	-.32	.13	-.20	.08	.20	.55
Infrequency of colored, 1900	-.17	-.17	-.08	-.39	.53	.53	.71
Infrequency of colored, 1930	-.01	-.04	.05	-.27	.58	.59	.68
Manufacturing/farming, 1930	-.77	-.65	-.28	-.46	-.41	-.19	.17
Native-white literacy, 1900	.34	.29	.44	.08	.66	.72	.80
Bagley educational index, 1900	-.05	-.10	.15	-.26	.48	.53	.78
GP Index, 1900	.36	.19	.43	.12	.71	.64	.79
G of 1930	.23	.17	.44	.06	.61	.59	.90
P of 1930	.16	.11	.12	-.13	.65	.61	.63
I of 1930	.01	.00	.40	-.03	.41	.60	.91

Table 3A

Intercorrelations of the Measures of Differences Between Pairs of States

W 30 refers to correlations from the entire 1128 pairs
W 70 refers to correlations from the 990 pairs used in correlations of migration ratios for Native whites for 1870
C 70 refers to correlations from the 633 pairs used in correlations of migration ratios for Native colored for 1870
C 00 refers to correlations from the 854 pairs used in correlations of migration ratios for Native colored for 1900
C 30 refers to correlations from the 903 pairs used in correlations of migration ratios for Native negroes for 1930

Each entry in the table is the correlation coefficient between the measure described in the heading above it and the measure described at the left of it.

	G					I					P					GP of 1900				
	General goodness					Per capita income					Personal qualities									
	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30
G																				
I	.85				.91															
P	.78																			
GP of 1900	.87	.85		.90	.90															
Latitude N	.80	.76		.86	.85	.57			.69							.75	.73	.81	.81	.81
Longitude W	.18	.19		.20	.18	-.01			.05		.11					.35	.36	.28	.32	.32
Area	.11				.12											.27				
Density in '60																-.19	-.20	-.14		
" " '80																-.14			-.07	
" " '00																				
" " '20	.03															-.15				-.08
Cityness '30	.49	.48		.57	.57	.73			.78							.30	.29	.42	.44	.43
" '00	.48	.47		.54	.54	.74			.76							.31	.28	.42	.41	.40
Mfg./farm	.14	.15		.17	.21	.50			.48		-.11					-.08	-.03	.00	.03	.03
Infr. col. '30	.76				.82	.51			.60							.81				
" " '00	.71				.79	.59			.71							.76				
N.W. lit	.87															.91				
Bagley index '00	.81															.83				

It is possible to measure the fraction of the variation in IM that is accounted for by any combination of the eighteen measures (including what is involved in them), by multiple correlations. For example, in the case of native whites of native parents for 1930, the multiple correlation of longitude, area, density of population in 1920, ruralness of 1900, manufacturingness, and the GP score of 1900 with the migration ratio is .904, so that 82 percent of the variation in the latter is caused by the former or by what causes the former. For native whites of foreign or mixed parentage, the correlation for the same combination is .92, and the percentage of the variation accounted for is .84 1/2. For the Negroes of 1930, longitude, G score and per capita income score together give a multiple correlation of .966 and account for over 93 percent of the variation.

Table 3B

	Latitude North					Longitude West					Area					Density of population, 1860				
	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30
Longitude W	-.02	.00	-.01	.03	.01															
Area	-.02					.91	.91	.88	.88	.89										
Density '60						-.916	-.915	-.906			-.89	-.90	-.88							
" '80						-.876					-.84		-.80							
" '00						-.888					-.84									
" '20						-.86				-.86	-.84			-.81						
Cityness '30	.14	.09	.26	.27	.26	-.31	-.33	-.31	-.27	-.29	-.28									
" '00	.27	.21	.34	.35	.49	-.40	-.41	-.32	-.30	-.33	-.40					.62	.63	.59		.59
Mfg/farm	.08	.04	.09	.11	.11	-.78	-.77	-.81	-.76	-.75	-.76					.86	.86	.91		
Infr. col. '30	.93					-.04				.07	-.07									
" " '00	.82					-.17				-.05	-.13									
N.W. lit	.80					.28					.23									
Bagley index '00	.65										-.12									

Table 3C

	Density of population							Cityness					Cityness					Mfg. farm	
	1880				1900	1920		1930					1900						
	W 30	W 60	C 70	C 00	W 30	W 30	C 30	W 30	W 70	C 70	C 00	C 30	W 30	W 70	C 70	C 00	C 30	W 30	C 30
Cityness '30					.63	.63	.62												
" '00	.66			.62	.71	.67		.93	.93	.95	.935	.935							
Mfg/farm	.84			.82	.85	.87	.88	.72	.74	.74	.71	.72	.71	.73	.69	.68	.69		
Infr. col. '30								.19					.31					.08	.02
" " '00								.30					.44					.18	.12
N.W. lit								.22					.29					-.08	
Bagley index '00								.58					.64					.34	

It is remarkable that five-sixths of the relative attractiveness of one state over another for whites in 1930 should be determined by a half dozen objective features, and that even fewer features account for over fifteen-sixteenths of it for Negroes. So successful an outcome of an investigation of this problem in the causation of human behavior would have been expected by very few. It should encourage students of man to pursue objective measurements more hopefully.

The facts for 1870 and for 1900 are also encouraging. For native whites alive in 1870 a single measurement, westness and what it involves, accounts for 94 percent of the superiority of one state over another in attractiveness as measured by the IM ratio. Adding other factors raises this only a little.

For native colored alive in 1870 the differences between two states in longitude, GP score for 1900, and latitude together give a correlation of .8934 and account for four-fifths of the IM variation (.7982). Longitude and GP score for 1900 do nearly as well, giving a correlation of .8869 and accounting for .7866 of the IM variation.

For native whites alive in 1900, longitude has a correlation of .90 with IM, and so accounts for 81 percent of the variation.

For native colored alive in 1900 the causation is much less well known. Longitude, GP score in 1900, and latitude together produce a correlation of .72 and so account for 56 percent of the variation in IM. The addition of other factors will raise this little, if at all. Longitude and GP do nearly as well, with a correlation of .731, accounting for 53 1/2 percent of the variation.

The main factors of the superior attractiveness of one state over another for whites are westness for those alive in 1870 or in 1900, and westness and manufacturingness for those alive in 1930. The fractions of the variation in IM accounted for by these are as follows:

	Native White 1870	Native White 1900	Native Parents 1930	Native White Foreign or Mixed Parentage 1930
By longitude	.941	.810	.56	.64
By longitude + manufacturingness		.813	.80	.71

The main factors for colored are G or GP, I and longitude. The fractions of the variation in IM accounted for by those are as follows:

	Colored of 1870	Colored of 1900	Negro of 1930
By G			.81
By GP	.50	.41	
By I			.83
By G + longitude			.894
By GP + longitude	.787	.535	
By I + longitude			.927

It is a plausible doctrine that the native-born have been pushed westward by the influx of immigrants from foreign lands. But such evidence as I have been able to gather does not support this.

(1) For each state one can compute, from data given in the Census reports for 1930 and 1900, the measure $\frac{\text{Foreign-born whites in 1930}}{\text{Foreign-born whites in 1900}}$, which is more or less indicative of the recent influx from foreign lands (from 1900 to 1930). This ratio is, for example, 1.25 for Massachusetts, 1.28 for Rhode Island, 1.61 for Connecticut, 1.69 for New York, and 1.96 for New Jersey. It is .75 for Wisconsin, .77 for Minnesota, .54 for Iowa, .69 for Missouri, .92 for North Dakota. For each pair of states we compute the difference in respect of this measure, Massachusetts being more "pressed on" than Wisconsin, for example. We then correlate these difference measures with the IM ratios for Native Whites for 1930. The correlation is .25. The states that have been more sought by immigrants from abroad have not lost but gained in native migrants.

(2) For each state one can compute, from data given in the Census report for 1930, the measure $\frac{\text{Foreign-born who entered the U. S. in 1901-1930}}{\text{Foreign-born who entered the U. S. in 1900 or earlier}}$. This is 1.47 for Maine, 1.24 for New Hampshire, 1.97 for Vermont, 1.78 for Massachusetts, 1.66 for Rhode Island, 2.31 for Connecticut, 2.91 for New York, .89 for Wisconsin, .72 for Minnesota, .57 for Iowa, 1.04 for Missouri, .95 for North Dakota, .61 for South Dakota. For each pair of states we correlate the difference in this measure with the IM ratio for native whites alive in 1930. The correlation is practically 0 (+ .02).

(3) Another independent line of evidence relates to the correlation of the 1900 IM ratios with differences between states in the pressure of foreign immigrants before 1900. We find for each state the percent which the foreign-born whites of 1900 were of the native-born whites of 1900; and then compute the difference for each pair of states. The correlation of these state difference measures with the IM ratios for native whites alive in 1900 is .18 for the 1128 pairs of states.

By each of these symptoms of pressure of immigrants from abroad it appears, somewhat surprisingly, that the states which have been beset by foreign immigrants are more attractive to native-born white migrants rather than less. The matter could well be investigated further, since the three measures are not just what one would like as indices of pressure of foreign immigrants, but it is extremely unlikely that more adequate measures will show the "driving out" of native-born by immigrants from abroad as an important cause of the inter-state migrations of natives, westward or in any other direction.[4]

The bulk of the causation of the greater attractive power of one state over another is presumably economic and social. People go where they can earn higher real wages, and where they can have self-respect, friends, entertainment, and other social values. Thus the general movement westward from 1800 to 1900 was presumably largely caused by rich soils, free land, forests and mines, and the like. Thus the special attraction of manufacturing states from 1900 to 1930 was doubtless due in considerable measure to their economic advantages. Thus the migration of Negroes to states high in I and G has doubtless been due in large measure to more satisfying economic and social status.

However, consideration of the contributions to the inter-state migration quotients leads me to the opinion that factors over and above higher real wages and superior "psychic income" have been potent. I think expectations of wealth and

[4] It would perhaps be as reasonable to argue that the excess migration of native-whites from state A to state B created an economic and social vacuum which sucked into state A immigrants from abroad. The most reasonable present supposition is that the relative attractiveness of one state over another which is different for native whites of native parents, native whites of foreign and mixed parents, and negroes, is still different for foreign immigrants from Europe, and in such ways that attracting the European-born does not result in either expelling the American born or attracting more of them. The influence of immigration from Mexico may be still different.

happiness, as well as actualities, have had a substantial share. Just how much migrants from one state to another have improved their lot is not known. Also an element of sheer ideas and custom seems to be needed to account for the continuance and magnitude of the pull westward. On the other hand, northness has apparently made no such intrinsic appeal to the Colored as westness has made to the Whites; and the Colored have moved to a more western state, other things being equal, though perhaps neither they nor sociologists have been much aware of it. It is probably unwise to try to appraise the motives of inter-state migration until an investigation has been made of the individual histories of an adequate sampling of migrants.

APPENDIX

Note A

Differences in the Causation of Inter-State Migration at Different Periods

For native whites alive in 1870 the main forces that had drawn persons from one state to another were westness and what it involved. Score in westness accounts for .94 of the score in IM, and nothing else in our set of measures raises this to .95. For native whites alive in 1900, score in westness is still very potent, accounting for .81 of the variation in IM. Manufacturingness and cityness in 1900 raise this slightly. For whites alive in 1930, westness is less potent and manufacturingness attracts strongly.

For colored persons alive in 1870 the main forces that had drawn colored persons from one state to another were the conditions measured by the GP score and westness, which together accounted for .79 of the variation in IM score (which is about nine-tenths of what all of our measures together can account for). For colored persons alive in 1900 these two accounted for .53 of IM (which is also about nine-tenths of what all our measures together can account for. For negroes alive in 1930 these two together accounted for .89 of the variation in IM, or about 95 percent of what all of our measures can account for. For Negroes of 1930 income plus longitude will do even better, and it is probable that if we had measures of income for 1900 and for 1870 the same would be true for migration up to those dates. The movement

of Negroes to the north is entirely accounted for by the north-south differentials in G and I. When a state to the south is superior in G and I, they move to it, for example from Georgia to Florida.

Note B

Results to be expected if each inter-state migration ratio were weighted by the number of persons involved.

In all the foregoing any pair of states is given the same weight as any other pair, except for the omission of certain pairs where the ratio had one term under 6 and the other zero, or where the total number of persons involved was less than 10. It would be possible, and for some purposes desirable, to attach weights in any desired relations to the number of persons involved.

I have not been able to do this, but have done enough to show that the main conclusions of the present report would hold true if weights were by persons rather than by states. What I have done is to check these conclusions by using only the pairs of states when the number of persons involved in the ratio was very large. For example, the correlation, for native whites alive in 1870, between the IM ratio and longitude for pairs of states where n is 10,000 or more is .966. It was .97 for all pairs. The correlations between the IM ratio, longitude, and manufacturingness for native whites of native parents alive in 1930 for pairs of states where n is 10,000 or more are much like those for all pairs of states, being as follows:

	Pairs with n-10,000 or more	All pairs
Correlation of IM with longitude	.74	.75
Correlation of IM with manufacturingness	-.18	-.28
Correlation of longitude with manufacturingness	-.61	-.78
Percentage of the IM variation determined by longitude and manufacturingness combined	.67	.80

For Negroes alive in 1930 for pairs of states (202 in all) where n is 2000 or more, the correlations of the IM ratio,

G, and I are even higher than for all pairs of states, and the percentage of the variation in IM accounted for by G, or by I, or by G and I together is larger than it is for all pairs of states. The correlations of IM with longitude and of G with longitude are both lower than they were for all pairs, with the net result that G and longitude together account for more of the variation in IM than they did in the case of all pairs. The partial correlation of latitude with IM, after eliminating the influence of G and I, is practically zero, as it was for all pairs.

Consequently it seems supererogatory to undertake the labor of weighting the 6764 IM ratios used and computing new sets of correlations with all or any of the eighteen measures of differences in latitude, longitude, area, density of population, etc.

Note C

We may inquire how far the correlations of Table 2 and Table 3 would hold true of migration ratios and difference measures in an infinite number of pairs of states from which the pairs used in this investigation were random samples. The divergences might be substantial in correlations between +.70 and -.70, as shown by the Table of P.E.'s below. This may serve to remind us that the relations and causes found in this investigation need not be precisely true for white or colored migrants in general, for example, in Europe, or in 1970.

All the correlations of Table 2 and Table 3 were computed by Sheppard's formula (for correlation in terms of percentages of unlike signs). The probable errors run from less than .01 for correlations above .90 in the 1128 pairs of states to .06 for the correlations near zero in the 633 pairs for negroes in 1870, as shown in the Table of P.E.'s below.

Table 4

Table of P.E.'s of the Correlations in Tables 2 and 3

		1128 pairs	990 pairs	903 pairs	854 pairs	633 pairs
r = .95	(%u = 10)	.007	.008	.008	.008	.010
r = .89	(" = 15)	.013	.014	.014½	.015	.017
r = .81	(" = 10)	.019	.021	.021½	.022	.026
r = .707	(" = 25)	.025	.027	.029	.030	.034
r = .59	(" = 30)	.031	.034	.035	.036	.042
r = .45	(" = 35)	.037	.040	.042	.043	.050
r = .31	(" = 40)	.041	.044	.046	.047	.055
r = .15½	(" = 45)	.043	.047	.049	.050	.058
r = 0	(" = 50)	.044	.048	.050	.051	.060

THE APPLICABILITY OF THE METHODS OF NATURAL SCIENCE TO SOCIAL PHENOMENA

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Part I

Postulates and Principles

The gap in our methods of thinking about the social and the physical world is far wider than most of us can at all appreciate.[1] It is easier to understand these differences when one remembers that the foundations for the social concepts of today were laid long before the beginning of recorded history. They rest, for the most part, on facts that have been observed or observable by men since the dawn of civilization. The physical sciences, on the other hand, have developed mainly within the past few hundred years and by far the most rapidly within the past century. They began with familiar facts but they rest now also on facts which were not known to previous generations. Earlier there did not exist the means by which these facts could be observed. There have been new telescopes, microscopes, galvanometers and photo-electric cells to expand man's field of observation in the physical sciences but no like advances in the social sciences. Until some new instruments or techniques of observation or reasoning are devised, the social sciences must continue to depend on facts that men have known for ages. It is doubtful if there are any very basic new phenomena in this field of thought, although many facts may have been overlooked, forgotten or perhaps more likely may have come to be taken for granted through long familiarity and thus may escape critical analysis.

The physical sciences require exact and realistic ideas or concepts which must be given names. These must be uniformly accepted and understood by those who use them for the particular purpose in hand. The physical sciences

[1] In the first four chapters of G. A. Lundberg's FOUNDATIONS OF SOCIOLOGY (MacMillan, 1939), this gap between the two realms of thought is bridged with remarkable completeness.

therefore deprive their devotees of most of the enjoyment of debate since most debate depends for its interest on differences in terms or their interpretation. In mathematics, chemistry and physics, as well as in the biological and medical sciences insofar as they have become factual sciences, men first conceive of a definite idea, give it a name as the mathematician gives the appellation "X" to the particular unknown quantity with which he is concerned, and thereafter use the name or word to express that idea within the particular field of thought with which they are concerned. There are no such things as "correct" and "incorrect" names in this connection provided only that all concerned use the word in the accepted sense and apply it only in the particular field for which it has been defined.

The physical sciences rest on a firm foundation of proven generalizations that have come to be accepted as "natural laws." On these there is substantial if not complete accord among all competent students of the subject. On these foundations rests most of the new knowledge which has revolutionized living in the past few hundred years. Differences of opinion may arise even among factual scientists regarding "laws" not yet firmly established or results not yet fully understood. Such differences, however, are recognized for what they are. They do not crystalize into dogmatic "beliefs," or else they no longer find a place among the factual sciences. Here there is no room for dogmatism. We know that this paper has not escaped altogether the appearance of dogmatism, but we hope it is the dogmatism of the mathematician who states a proven proposition without giving the proof.

Are there in the social field facts and generalizations which are comparable to those of the factual sciences? Several statements which follow may be examined from this point of view.

A. Production Equals Consumption. An isolated social group must produce whatever it consumes. If the group has commerce with another group or nation such that exports and imports are balanced in value, it must produce the equivalent of what it consumes. A corollary to this is that no individual may consume more than the equivalent of what he produces unless some other individual consumes less than he produces. (Goods and money are stored for later use, but the total amount of storage of either which can take place is limited and its variations are still more limited.)

B. Self-Preservation. Every individual tends to satisfy his own wants with least effort or discomfort unless subject

to some force or constraint which modifies his actions. This seems to be a law of nature expressed in the statement "Self-preservation is the first law of nature." The existence of community life requires that the primitive behavior of men be modified in the interests of the group.

C. Basic Social Constraints. The constraints and forces which society has developed to modify men's primitive tendency to satisfy his own wants without regard to the social welfare are incorporated in social codes of Law, Custom, Ethics and Religion. No attempt is necessary to define these terms accurately in relation to each other since each suggests a recognized phase of the general problem of social control. Other terms like "mores" cover partly the same ground.

D. Limited Power of Constraint. Constraints and forces such as are covered under C are limited in their potency for control of men's actions. The law of self-preserva tion takes precedence in extreme emergencies. As a corollary, the forces and constraints whereby men are induced to act in the interest of society, or of some leader, rather than to gratify their own primitive wants, can control the acts of men only up to some limit set by the power of the constraints the intensity of the wants they are asked to forego and the docility, or like trait, of the men.

Note that the last three postulates may have something in common with the familiar laws of matter and motion. The first "law of motion" states "that everybody (material) remains in a state of rest or of motion in a straight line unless acted upon by some external force." The universal force of gravitation acts on all bodies and for those on the earth it is substantially constant. When the engineer designs a structure or machine he must introduce forces and constraints to overcome the universal force of gravitation and to produce the actions that he requires. The tendency of men to satisfy their own wants corresponds to the universal force of gravity on material things. Before the "engineers" of society could build a highly developed social structure this primitive force would have to be directed or constrained and new forces introduced to create a working "society." If the mechanical engineer cannot or does not supply forces and constraints of sufficient strength (D) his structure will fail. Similarly the social structure will fail if the "social constraints" are not powerful enough to control men's actions despite all the stresses to which they may be subjected.

E. Two Ways of Life. Two mutually exclusive "ways of life" represent opposite social poles toward which all social

structures tend to drift. (The word "tend" is used although in some cases the tendency is weak.) These two ways of life may be termed (1) the non-parasitic way of life or social structure, and (2) the fully parasitic way of life.[2] Between these two extremes fall an infinite variety of possible compromise systems which are unstable. (See G below.) Ideally the non-parasitic social structure is one in which the products of society are distributed to each individual in proportion to what he produces or contributes to society. No man may have more than this without depriving some other of what he produces (A). That is, only under this condition can a society be fully non-parasitic. (2) In the parasitic way of life the products are distributed among the population in some arbitrary manner depending on other considerations than each man's productivity. There is no ideal which corresponds to this way of life but rather a multiplicity of ideals depending on the particular distribution of products to be accomplished. Such systems require some supreme authority to determine and to maintain the particular arbitrary distribution of products considered desirable. A single exception is the highly idealized solution of a uniform distribution of products among men without regard to what each produces. Apparently the social constraints (C) cannot be made potent enough (D) to induce a large part of the population to relinquish part of what they produce, for the benefit of the less productive part of society, so this solution seems never to have been reached in any large society.

F. Tools Necessary for a Society of Plenty. The creation, conservation and effective use of "tools" are essential to a civilization of plenty. "Tools" denote here all the things, material and otherwise, which serve to increase the efficiency of the "work"[3] which men do. The possession and

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[2]The usual biological definition of parasite is here used. A parasite is an organism which secures part or all of its subsistence at the expense of a host. Human parasites commonly are partial, not complete parasites. The host commonly is society as a whole. The subsistence is in the form of money. The same conventions are followed as in considering nature. The young in training and the old who have served society are not "parasites." Only those who do not on the whole contribute to society as much as the equivalent of what they receive fall in this category.

[3]Work is used in the ordinary dictionary sense of human work, with some clarification. It includes all human effort devoted to the production of that which may enter into exchanges with other men, therefore effort which has at least a potential "money" value. Money invested in tools may be said to be "at work."

use of tools is perhaps the clearest dividing line between human society and that of the lower animals. The extent of the use of tools also marks the stage of civilization, if we exclude the "tools of war." No civilization can continue if its tools are depleted either by enemies from without or by parasites from within. The basic variable in the social equation seems to be the amount of work which goes into tools in proportion to that which goes into the production of consumables. If the proportion going into tools increases, civilization tends toward "plenty"; if it decreases, plenty declines and the scale of living falls progressively so long as the decrease continues. The increase in efficiency through the use of tools is very large. It appears that on the average a given amount of work devoted to tools yields about twice as much for consumption as if consumed directly.

G. Unstable Processes. In the social field there are processes analogous to the "unstable" processes familiar in the physical sciences. Their partial recognition is indicated by such loose phrases as "vicious circle" or "vicious spiral." Such processes have one factor always present. When some change begins to take place this change sets up forces which speed up the original change. For instance a trunk balanced on its edge begins to tip. As it moves, the force tending to displace it increases and it moves at an increasing rate. Or, for example, prices of some kind of property begin to rise. The rise encourages speculation or increased purchases of this property. The increased purchases further raise the price. Or the polar snow caps on the earth increase in area. The increased area of snow results in lower average temperatures. The lower average temperatures further increase the snow area. There follows an ice age. Similarly parasites get hold of and deplete the tools. Depleted tools leave men idle. The unemployed become added parasites. Tools are further depleted and there follows an "ice age" of human want. Such "ice ages" have constituted much of human history.

If some new force develops later to stop the process, the system is a cyclic one. If no such force is developed, the process goes on progressively. Some familiar processes are cyclic ones, such as the vibration of a violin string, the "shimmy" of an automobile or the rise and fall of a business cycle. Others once started go on to extinction, as the self-ignition of an oily rag, or the crack up of a business, a nation or a world civilization, once the destructive course of events begins. There are familiar mathematical treatments for some of these processes. Those for which there are

rigid solutions throw much light on those, like the social ones, which cannot as yet be solved mathematically.

H. A Necessary Relation Between Saving and Investment. In any society using money as a medium of exchange the process of exchange (that is, prices and employment) will be stable only when men in the aggregate invest money as fast as they save money, or in a growing economy when the rate of investment exceeds the rate of saving by a definite amount.[4] If the rate of investment exceeds the rate of saving by more than enough to provide for growth, there will be rising prices or inflation. If the rate of saving exceeds the rate of investment there will be falling prices, unemployment and deflation. This has been called a "truism" but its very basic significance seems not to have been fully grasped. Among the social postulates stated above, this one alone depends on money and thus is capable of mathematical exactness. Statistical methods are not yet adequate to verify the fact that a given difference between the rates of saving and investment will result in an exactly compensating change in prices or employment. Yet with consistent definitions of the terms this one "law" or axiom as the case may be is found to have most important consequences.

1. Selection of Variables. In problems involving many variables it often is possible to combine these variables in such a way as to reduce their number and make possible the solution of problems that otherwise could not be solved. In the application of mathematics to physical problems there are standard methods for reducing the number of variables by combining those which have the same "dimensions." While no such formal methods seem applicable in the social sciences and the idea of "dimensions" is not familiar in this field, the general method is applicable and may be as fruitful here as in the physical sciences. For instance among the foregoing definitions the terms "wants," "products," "tools," "work" and others are inclusive each of several commonly used variables all of the same "dimensions" which for the purposes of this

[4] It will be evident, we believe, that saving and investment play a double role in the economy. The total rate of saving and investment is vital because this rate determines the rate at which tools can be built and therefore the growth of plenty as discussed under (F). But the ratio between savings and investment is vital because on it depends the stability of the system of exchange, that is whether prices and employment are rising, falling or remaining stable.

discussion may be combined. Work, for instance, may include not only direct human effort but the returns on money used to build tools, and therefore "at work." On the other hand some terms require for our purposes to be split definitely into two parts because they play different roles depending on conditions. "Competition," "interest" and "profits" each represent two distinct factors which are not of the same "dimensions" in the social analysis.

2. Sampling. One technique familiar both in the physical and the statistical sciences seems to have been less understood and more often misused in the social and economic fields. Here sampling seems often to have been confused with "exampling." Properly chosen samples in any field of thought permit valid conclusions. Under proper conditions these conclusions may be numerically exact or they may offer a firm basis for inductive reasoning. Examples, on the other hand, have no such validity, although they are useful as illustrations of principles. An automobile adjusted by a contestant for an economy contest and a highly successful industrialist selected by a debater for his purposes may be good examples respectively of what an automobile and an industrialist can do. Neither has any standing as a sample of what either may reasonably be expected to do.

The technique of sampling and that of combining variables of the same dimensions, and separating those not of the same dimensions have been employed consistently we hope in the analysis which has led to the material outlined in this paper.

The foregoing eight statements, together with some others of similar nature which might be added, resemble some of the accepted "laws" on which the physical sciences are based. This does not imply that there is any one-to-one analogy between these and any of the other natural laws but rather that the above are general statements of facts (if they are facts) applicable to the most fundamental social processes. Therefore they seem to be applicable to all times and places. In this respect they resemble the familiar "laws" of physics, chemistry, astronomy, mathematics, and those of biology and medicine insofar as these have become factual sciences.

While the writer believes that all of the eight statements can be proven correct beyond reasonable controversy this would require tedious argument and another method seems preferable. If these are valid statements, like the "laws" of physical sciences, they must meet the test of application to any problem of the type in question. If when so applied they

lead to only consistent and logical conclusions, their validity is established. But if they lead to conclusions that are mutually inconsistent, they are, to that extent at least, invalid. This is the invariable criterion of the validity of the natural "laws" and must be met by any "laws" in the social field which merit a place in factual sociology.

Part II

Applications and Illustrations

In any highly developed society large numbers of the people are "gainfully employed," that is they work[5] for money,[6] spending the money to supply their needs instead of producing directly what they require as is done in primitive society. Since all that men have in any stage of society is the result of work, combined with the available tools and natural resources, it follows that the degree of "plenty"[7] depends on the

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[5]The term "work" has been defined in Part I.

[6]The term "money" needs explanation. To define it as "a medium of exchange is like defining "thinking" as "Ratiocination." Money is a symbol for work. To be valid, money must represent as much work as is required to produce the thing the money will buy. Valid money can not be produced without the expenditure of an equivalent amount of work. Ordinarily money changes hands only when an equivalent amount of work changes hands in the opposite direction. If money changes hands without the exchange of an equivalent amount of work, as by gift, subsidy, gambling, theft or crime, one party is aggrandized at the expense of another. If money is created without an equivalent of work, as by counterfeiting, expansion of credit without security or printing money without coverage, the creator of the money is aggrandized at the expense of society. Of course when credit is expanded with pledged security money also is expanded but the property which represents the security is the product of work, and when pledged as security it in effect becomes the property of the lender. In this case, therefore, it cannot be said that money is created without a corresponding amount of work being done.

[7]The term "plenty" is used here to denote that which men have overaand above the necessities of bare existence. It does not refer to any particular state of society since some degree of plenty is necessary for race survival. Like the terms "light" or "heat," any stage of plenty could be defined if there were units in which to express it, but it has meaning here mainly as it increases or decreases. Its absolute level is largely a matter of custom. The "plenty" of 100 years ago would seem like poverty now.

number and the efficiency of those who work as compared to those who do not. Work without tools is never efficient and the broad use of tools calls for gainful employment. A high level of plenty, therefore, can be reached only by expanding the use of tools and the number who work for money.

It would seem that the process of working for money is a vital element in any civilization which has reached a level of plenty much beyond that of the primitive peoples. If the conclusion is correct the physical scientist in his own field would consider it necessary to master fully the subject of "work-for-money." In appraising the phenomenon he would follow the time-honored formula of applied physical science for an attack on any such problem. This calls for answers to three questions. "What is it?"; "Why is it?"; "What to do about it?". A descriptive science such as descriptive astronomy, descriptive botany, most of statistics and unfortunately too much of sociology, is concerned only with the first question. Astrophysics, much of biology and other analytical sciences are concerned with the why of things. The applied sciences, however, are concerned with all three questions. Politics, which seems to deal exclusively with what it is and what to do about it with no slightest attention to why, is not called a science. But it should be applied sociology.

Work-for-money, however, seems to be a comparatively simple phenomenon. Its nature, causes and effects do not appear to be beyond the realm of human intelligence. Yet a little candid, objective thinking seems to indicate that it is one if not the key element in the surge of world events. So long as the normal number of people are steadily engaged in gainful employment, without any too violent change in what they receive in return, no serious social, national or international disturbances are likely to appear. Historically no such instances seem to have occurred.

For convenience one may consider work-for-money under three headings, although the three phases of it are intimately related to each other in many ways. These three phases are (1) the number or the percentage[8] of the people who work for money. (2) The efficiency of work for money (as well as of work not for money) and (3) The stability of the process, that is, its liability to sudden variations.

[8] We use the terms number and percentage for convenience. Some people, farmers and others, work for money a more or less indefinite part of their working time. But it is more convenient and equally valid for our purposes to consider the equivalent number of full-time workers for money.

(1) The Number at Work for Money

The normal number, or equivalent number, of people in any given social group who work for money seems to be much dependent on the particular social structure. It is greater in an industrialized society than in an agricultural one. It is greater in urban than in rural areas. It is high in a society with a high level of plenty, also in a society that recently has degenerated from such a level. It depends greatly on the use of tools. The "whys" of this should be not far to seek. Tools seem to be the key to the situation as suggested under (F). Tools always increase the efficiency of men's efforts, therefore, men strive to acquire or to work with tools. For men always seek the most satisfaction for the least effort (B). But tools demand specialization to realize their full effect. This means that men tend to concentrate on producing one thing or doing one kind of work for the sake of greater output, while they wish to consume a wide variety of things. Obviously they cannot, individually, consume the particular things they produce. This means exchange, by barter or money. The latter method only is generally efficient.[9]

In respect to the customary number who work for money there probably is not much "to do about it." Long, slow adjustments of social and economic customs seem to reflect the joint mass desires of the people, under the particular environment they occupy. The trends probably can be changed only by changing the environment. In the United States, which reached between 1920 and 1930 what was perhaps the highest level of stable plenty the world has known, some 40% of the people worked for money. Following 1923 this ratio seemed to be decreasing but very slowly, about 0.3% per year. This decline probably reflected a slow drift in social customs toward longer schooling, earlier retirement and possibly more mothers remaining in the homes. One might even guess that something under 40% gainfully employed is an optimum for our particular sort of society. But it certainly would be hazardous to try and change the figure arbitrarily.

[9] We use the term "efficient" as used in the physical sciences, as the ratio of the work put in to the desired result. Where the work and the result can be measured in some unit "efficiency" has a numerical value. Where the result is not measurable, as when it is human satisfaction, it has no numerical value but is none the less real. In comparing the efficiencies of different social processes, however, the more efficient is generally that whereby men "get more for their money," money being the accepted means of measuring men's ordinary effort.

To increase it arbitrarily, as is necessary in time of war, would reverse some seemingly desirable social trends. To reduce it would lower the level of plenty, unless there were a balancing increase in the efficiency of tools, and would involve danger of "parasitism" to which we shall refer later. The decline in the 20's certainly accompanied rising efficiency in the use of tools.

(2) Efficiency of Work-for-Money

The efficiency of work for money seems to be almost wholly determined by tools, including their invention, creation, conservation, renewal and efficient use through organization. The vital importance of this factor merits much more attention than has been given to it. Tools can be invented, created and efficiently used only by rare individuals. They can be produced only out of "savings."[10] If tools are depleted either through neglect, foreign conquest, falling into the hands of inefficient management, dearth of savings for their upkeep or replacement, the level of plenty with decline progressively. The process is insidious because a temporary increase in plenty always can be had by temporary neglect of tools, that is, by undue decrease in savings. This temporary increase in plenty may give a false sense of social well-being which is unstable and will be followed by a precipitate decline as the depletion of tools lowers efficiency. This appears to be the universal process by which nations degenerate. It is referred to by Prof. Ronald Petrie in "Cycles of Civilization" (1911). The process is identical with that seen on a small scale in the decline of farm units in agriculture. As will be noted later this process of national decline is intimately related to instability of the process of work-for-money.

Once the process suggested above is fully understood the "What to do about it" should be obvious. Tools must be maintained at all costs. Nations always have guarded themselves as best they could against foreign invasion which would destroy their tools and work other harm. Only those nations surrounded by natural barriers against invasion have generally achieved a high level of plenty.

The process of saving must not be too much curtailed. No one knows how much curtailment is safe, because

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[10] By "savings" we refer to money which is withdrawn from the flow of spending for consumables and set aside for future use. Thus "savings" may be "invested" qv. in tools with the expectation of recovering the "savings" (with interest or its equivalent) from the use of the tools.

of the misleading false prosperity which accompanies neglect of saving and of the upkeep of tools. In general the remedy is to see that saving and the creation of tools are expanded and maintained, even though at some apparent sacrifice. The Russian "five-year plan" represented in effect forced savings instead of our practice of utilizing savings set aside voluntarily by those with large incomes. Only by some surplus of tools, can the efficiency of work-for-money be maintained and with it the level of plenty for the mass of people.

(3) Stability of Work-for-Money

The stability of the process of work for money, that is, its freedom from sudden arbitrary changes particularly downward, is perhaps more vitally related to the whole social structure than any other familiar phenomenon. Men adjust themselves to very slow changes up or down in the opportunities for gainful employment, and to quite wide variations in the efficiency of work for money. Changes in prices mask some of these effects without any very serious social disturbances. When many men lose their jobs they drift slowly into agriculture and at least secure food and shelter as many did in the 30's despite all attempts to soften the burdens of unemployment.

But sudden changes in the opportunities to work for money present an entirely different picture. If those opportunities increase, as they must in time of war, people must be displaced suddenly from such non-gainful work as on the farm, in the home and in school, as well as from those occupations no longer necessary. If the opportunities decrease, as they do in times of "depression," the social results are vastly more important. In fact the thing we call "depression" is a period of decreased opportunities for gainful employment. Nearly all the varied phenomena which make up a "depression" clearly are consequences of a sudden decrease in the number who can find work for money. The familiar recurring "business cycles" are periods in which there is first a demand for increased numbers of workers for money, as reflected by rising prices, followed by decreased opportunities to work for money because of a decreased demand for products, or rate of purchasing them.

This behavior strongly suggests the sort of instability noted under (G); it would seem that the social scientist has the same obligation to master and understand the subject of stability of the process, work-for-money as the aerodynamic scientist has to master the problems of stability of aircraft

in flight or the automotive engineer the stability of steering of motor cars. There would be no jobs for either of these professions if the stability problems had not been understood and reasonably solved. There are many possible instabilities in the structure of any airplane and its behavior in the air. Most of these must be eliminated if the airplane is to fly. Like problems occur throughout all fields of engineering and must be solved before progress can be made. Every now and then an unsolved one turns up, as in the wreck of the Seattle bridge, emphasizing the failure of engineers to foresee all possible conditions.

Under (H) we have referred to an axiom (which economists often dismiss as a truism) which states that if the rate of "saving"[11] always equals the rate of investment, the rate at which money changes hands, therefore, work-for-money, also will be constant. And as a corollary, if the rate of saving exceeds the rate of investment work-for-money will decrease, or if investment exceeds saving prices will rise inviting an increase in work-for-money. (These statements are exactly true only if the definitions of the terms used are consistent with each other.)

The classical economics holds that investment always will equal savings because it is of no advantage to men to hold uninvested savings. But if this conclusion were true work-for-money would of necessity be constant. There would not be periods of mass unemployment. There being such periods, evidently the rates of saving and investment are <u>not</u> always equal. If in addition to this it should be found that an excess of savings over investment <u>encourages</u> still more saving, or if an excess of investment encourages still more investment, the system of work-for-money is an "unstable" system like those noted in the foregoing examples.

This appears to be the case. When men save more money than is readily invested they have two alternatives, (1) to leave the savings idle or (2) to purchase existing securities or property from other investors. If they follow the former course there will be a <u>decrease</u> in work-for-money, falling prices and encouragement to further saving with less investment. If they follow the latter course the market for existing investments will expand, prices will rise and others will be induced to make further investments. This all suggests

[11] Saving: The setting aside of money, normally spent for consumables, for the purpose of using it later. If "invested" qv. the savings commonly yield a return as interest or earnings.

that the balance between saving and investment is an unstable one which, in the physical sciences, would be recognized as characteristic of a cyclic system. The apparently cyclic nature of "business cycles" seems to support this conclusion. It suggests that the rise in prices followed by decreased work-for-money of a business cycle is the manifestation of an instability brought about by the ancient practice of lending savings on long term notes. It seems to be the rigidity of these which prevents the current investment of all savings. If one examines the classical theory on this point he finds that the effect of these notes or like obligations is not taken into account.

If an adequate study of the stability of work-for-money verifies these conclusions one may turn to the third question: "What to do about it?" Two steps appear obvious. (1) Parasitism must be avoided or kept under control because it is another unstable process as outlined under (G). Once allowed to start growing it will expand increasingly, decrease progressively the number of workers-for-money, lower the level of plenty, dissipate the tools and finally reduce the social structure to the level of bare subsistence. (2) The rate of investment must be prevented from falling below the rate of saving, in order to insure work-for-money against any sudden decrease. If this is done there will be no mass unemployment in the usual sense. It is desirable also, if not necessary, to prevent the rate of investment greatly exceeding the rate of saving. To do so would prevent sudden rises in the price index. There would seem to be means for accomplishing this as well as the two main objectives.

Illustrations

The term parasitism as used above may serve in a measure to illustrate what we mean by the method of the physical sciences as applied to the social problems.

"Parasitism" represents an abstract concept, the process of acquiring subsistence at the expense of another, without rendering an equivalent service in return. The concept itself is reasonably definite. One should be able to deal with it without the convention of the Aristotelian constraints. In the physical sciences we have necessarily escaped some of the constraints that still hamper thinking in other fields. Following Aristotle one would have to define a noun "parasite" and set up an absolute category such that one could say always that all who practice parasitism are "parasites" and included in this category. Conversely all who do not practice

parasitism are outside this category. It is customary also in the social field to think of "parasites" as anti-social or bad. Therefore, all who are in the parasite category are branded as bad. Of course all this is quite impossible if one is to think impersonally and objectively as a physical scientist must. To him the concept is the important thing regardless of who practices it and to what extent and whether it is a desirable practice or otherwise.

As a physical scientist one is interested first whether the concept of a parasitic process is consistent with known facts; whether some actions of men are correctly described by the concept while other actions are not of this nature; whether as the magnitude of the parasitic process increases "plenty" decreases for the hosts; whether the parasitic process is cumulative or "unstable" and whether under certain defined conditions parasitism results in continued mass unemployment. We know already that the latter leads to disastrous results.

One perhaps inquires, for instance, whether the British nobility are parasitic. It is quite immaterial to this process whether they are or are not to be classed as parasites. In fact it is quite unnecessary to try and meet the Aristotelian demand for a one to one relationship in defining "parasite" and it certainly is not a question whether "parasites" are good or bad. In fact they are distinctly both if one wants an answer.

However, one question can be answered. If parasites, receiving incomes they do not earn, always spend all they receive as income, and for the things men ordinarily buy, they do not create or maintain mass unemployment, even if they are parasites. In this case they may be good parasites. But if they receive incomes which they customarily invest in tools, and in time of depression fail to invest income which continues to come to them despite depression, they do create and maintain mass unemployment. Then they are bad parasites, critically bad ones.

War expenditures in particular raise vital questions because on the nature of their debts seem to rest post-war experiences.

War expenditures build "tools," it is true, and the tools are necessary to win the war. But the only justification for borrowing money to build tools and paying interest on it is the fact that the tools are in existence and by their addition to the productivity of men, earn the interest. That is, through the use of the tools, productivity is increased enough to pay the interest. When war is over, barring a little salvage, there are no tools left with which to earn interest. It is

as if a man bought a house in which he could live and afford to pay interest on the loan from his saving in rent. But the house burned down without insurance. If he had to go on paying interest on his debt without the house to live in he would be in the same position as is society in paying interest on war debts after the war is over.

One should be concerned in this connection only with the cold fact that post-war debts exist and call for interest when there are no tools left with which the interest can be earned, not primarily with the justification for war debts or any moral issues which may be involved. Moral questions, however, are touched on later. The man who must patronize the pawn broker to pay for an operation for his wife certainly must and is justified in doing so. But this does not alter the fact that the debt is non-self-liquidating. In any case he must pay the principal out of his earnings but the interest he must pay is totally different than the interest he pays on the house in which he lives or on the tractor with which he cultivates his land. The point is that interest paid on truly self-liquidating debts is always good in its effect on society. Interest paid on non-self-liquidating debts also may be good for society as a whole but it may be bad. And in the latter case it may readily spell the death knell of most of what we look upon as worth while.

Finally we would cite two among the many problems which it seems that a valid social science must solve. And we believe the solutions present no prohibitive difficulty if the problems are attacked with the impersonal objectivity that the physical scientist must maintain.

Two Ways of Life

Under (E) we have referred to two ways of life toward which society seems to trend. One (1) is based on the ideal that every individual shall contribute to society the equivalent of what he receives from it. The other (2) admits a right of some individuals or classes to receive more than they produce at the expense of others. In the latter there is essentially an element of parasitism.

The social scientist should compare these two ways of life with the same objectivity which an engineer would apply in the comparison of the blueprints of two machines. For these are blueprints of a social machine infinitely more important to mankind than any one mechanical device, perhaps even than all such devices.

Under (B) we have noted that men seek to satisfy their needs and wants with a minimum of effort. Under (1) it is provided by law, custom, ethics and the moral code that a man may more readily satisfy his wants by producing what he or other men want than by taking it away from them. To make this effective taking things from others is made as difficult and unattractive as possible, or as society has been able to do.

Under (2) some race, class or group of the people is accorded rights to take what other men produce. This calls for a different social code recognizing these special rights and privileges, and for the favored class it becomes easier to satisfy wants by taking what others produce than by producing what others want.

Since society as a whole can have only what all men produce (A), which process (1) or (2) will produce more of what men want?

Since the distribution in one system depends on what men produce and in the other on what they take or can acquire through political action, which of the two is liable to distribute products to greater social advantage?

Since the one system is consistent with the existing social code (C) which presumes the right of the individual to what he produces, and the other calls for an entirely different code enforcing the rights of some race, color or class as compared to others, which of the ways of life is to be preferred from the social standpoint?

Since social constraints are necessarily limited in their potency (D), which of the two ways of life will throw more stress on these constraints? All this requires that the social scientist must have a clear, valid concept of what are and what are not services to society for which society is willing to repay the servant.

Since the key to plenty is the creation, conservation and efficient use of tools, which of the two ways of life will most effectively meet this requirement and thus assure plenty for the people?

In one system the control of production will be in the hands of those who produce the most of what men want. In the other control will be in the hands of those who acquire power over others. Which may be expected to offer greater stability for the workers?

Stabilized Work-For-Money

Previous pages suggest that it may be possible to do away with sudden changes in the process work-for-money, that is, with recurring periods of mass unemployment, within a society in which parasitism need not exist. Such a society so nearly approaches the classical ideal that a full knowledge of its possibilities should be a part of any valid social science.

The immediate results of a stabilized work-for-money would be to do away with periods of mass unemployment and with the excessive profits and losses which result from periods of rising and falling prices. However these primary effects must lead to many secondary effects which the social scientist must understand if he is to master his subject as do the physical scientists theirs.

Such a stabilized society, although apparently possible, never has existed so far as we know, for reasons cited above. One should, therefore, compare such a possible stabilized economy with those which have existed in the past; relative to such things as:

Stability of individual jobs, in the absence of mass unemployment;

"Exploitation of labor" when the total number of jobs is constant;

Need and effectiveness of "labor" organizations;

Social and economic effects of large incomes; when all income received is automatically spent or invested;

Relative need for social security provisions;

Stability of industrial output and of industry as a whole;

Relative need for business and industrial reserves;

Effectiveness of competition in securing max. efficiency.

One might cite an indefinite number of current social and economic problems on which the stabilization of mass employment would have profound reactions, which must be evaluated if the social science is to give any valid answer to "What to do about it."

Part III

A Challenge

For 5000 years at least we have had a descriptive science of astronomy. Men have asked themselves and have

partly answered; What is it? The pyramids of Egypt reflect a profound knowledge of how the stars behave. But it was not until the law of gravitation was evolved, and later the spectra of the elements and much about their structure became known, that astrophysics came into being and men could ask and answer to some extent, Why is it?

Since Aesculapeus there has been a descriptive science of disease, and men learned much through the centuries of what to do about it, by the tedious process of trial and error. But it was not until the germ theory of disease was accepted, followed by a mass of similar basic information that men could begin to answer "Why is it?" and something of "What to do about it" by rational analytical processes; "scientific" processes. Much was known about germs before the germ theory was accepted, and its acceptance was long and bitterly fought by the students of the descriptive "science."

In like manner one may say that there has been, since the dawn of history, a descriptive "science" of human society. Men have studied and recorded its behavior and of late have collected infinite statistics about it. Also they have tried as had physicians since Aesculapius to find out by trial and error what to do about it, wholly without success. Millions of individual patients could die in the evolution of a medical remedy by trial and error. But the deaths of nations are far apart and men cannot remember their errors from one age to another. So "trial and error" is futile here.

Here as in the medical field the "germs" have not been unknown. Some of them we have tried to portray in Part I. We believe the reader will recognize most of them as old friends, or enemies. Nor has there been entire absence of attempts to evolve an analytical science based on some of them. The "classical" school of the past century approached this goal. But it failed and has been discredited because a fatal mistake was made in assuming that work-for-money possessed a stability which it did not have. Other attempts also have involved fatal errors and have led to confusion rather than clarity.

It would seem that all this should challenge human thinking as it never has been challenged before.

SACRED AND SECULAR ASPECTS OF HUMAN SOCIATION

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III

Let us now turn our attention to the accessible secular society as a constructed type. In such a society the barriers to communication, transportation, trade, and social intercourse of any form have been reduced to a point of insignificance. In short, both physical and social mobility are present to an extreme degree. Status differentiations increasingly give way to a utilitarian occupational differentiation. The most important bar to communication between members of a society has often been the differential degree of literacy possessed by the members. Therefore, in the accessible secular society we find literacy raised to a high level and generally enjoyed by all the personalities within the society. Tradition and ceremonial are of relatively little consequence in the accessible secular society. In the regulation of social relations, tradition has yielded much to law and reason; the mores have waned in power and have been replaced by rational decisions made on the basis of "here and now." No distinction is drawn in the secular society between "home-folk" and "strangers" as such. In fact, strangeness and anonymity are the rule rather than the exception. Cosmopolitanism prevails; people are free to come and go as they please. There is no sacred feeling about the place of birth or the family into which one was born. Nostalgia, in the accessible secular society, is almost an extinct malady. The family has become particularistic and has

[1] As consultant and editor, not as writer. Joint responsibility, however, is to be taken for granted.

lost its sacred functions and reverential aspects. Marriage, where it exists, is a secular contractual relationship into which the parties enter for the purpose of immediate happiness and the gratification of comradeship and sexual needs. The arrangement may be easily and quickly dissolved if it should prove unsatisfactory for either spouse. The home is less and less necessary for child-rearing and training, as these functions tend to be taken over by secular agencies of the society. About the only home "tie" that still remains is a system of either patrinomial or matrinomial naming, and even this may be partially replaced by names freely chosen and legally ratified in adulthood.

It should not be assumed from what has thus far been said that the accessible secular society represents the epitome of the laissez-faire society as espoused and championed by Spencer and Sumner. Not at all. Individuation reaches its highest possible extent in the secular society;[2] but attention must be focused on the word possible. For consensus to exist--for a society to exist--some definite form of social control must be in operation to regulate the interrelations of the members of the society. Where tradition no longer has any regulatory effect, when mores become whims and folkways fancies, if complete atomization and societal chaos is to be prevented, then rational control, law and coercion, must come into sway. Thus, the more "emancipated" the personalities in a society become, the stronger and more centralized the governmental forms must become. Gossip and censure have little effect in the regulation of the social activities of the completely secularized personality; he can only be regulated by appeals to his own self-interest, and this must be done in the form of rewards and punishments devised by the law and administered by the government.

In Max Weber's classification of forms of social action, in respect to their modes of orientation, four distinct types are mentioned: (1) rational orientation to a system of discrete individual ends (means-ends rationality); (2) rational orientation to an absolute value (value rationality); (3) affectual, emotional orientation; and (4) orientation based upon tradition or the habituation of long practice. In defining the first-mentioned category, that of means-ends, or purposive, rationality, Weber explains that such action is oriented through

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[2]Cf. Howard Becker, "Processes of Secularisation," op. cit., pp. 270-286.

expectation as to the behavior of objects in the external situation, and of other human individuals, making use of these "conditions" or "means" for the successful attainment of the actor's own rationally chosen ends.[3] Now, in the accessible secular society, it is this type of social action, that which is oriented to a system of discrete individual ends, that is of paramount importance. It cannot be denied that in any empirically possible society--and therefore in our present constructed type of secular society--social action of all the four types mentioned will be found. But, whereas in the sacred society the fourth type, that is, traditionally oriented, will be both quantitatively and qualitatively of the most importance, and means-ends rationality of the least importance, in the secular society the situation is reversed, and traditionally oriented social action becomes of slight importance.

The accessible secular society, no less than the isolated sacred society, has its system of absolute values. The content of these values may be entirely different in the secular society, and certainly the means used for their attainment are more rational, and the values themselves are more fluid and dynamic than those of the sacred society. Nevertheless, there is such a system of values in the secular society, and it devolves upon the institution of law to devise enforceable regulations designed to obtain conformity to these values, whatever they may be. But if law is to be effective in its application and administration, its orientation must closely parallel that of the social actions which it seeks to control. It is for these reasons, then, that law in the secular society must appeal to the individual self-interest of the members of the society, rather than to their sense of duty, sense of justice, their conscience--super-ego--or certain sacred traditions, all of which latter are either lacking or exceedingly rudimentary in nature.

The secularized personality is not simply a means-ends rational machine. He is well supplied with sentiments and emotions, but in their expression these are notable for their evanescence and personal focus rather than for longevity or for traditional and symbolic orientation. In another place Becker has pointed up four principal types of irrationality.[4] These have been listed as: traditionally sacred, personally

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[3] Max Weber, Wirtschaft und Gesellschaft, p. 13.

[4] "Irrational Factors in International Relations," Chap. 27 of Brown, Hodges, and Roucek (eds.), Contemporary World Politics (New York: Wiley, 1939).

emotional, value-irrationality, and the irrationality of all final ends. Now, when we speak of the rational secular society as compared to the irrational sacred society, we are thinking particularly of those irrationalities which are founded on tradition. As for the other three forms of irrationality, we can only postulate that they seem to be necessary concomitants of any human society--whether it be sacred or secular in nature. Social action founded upon personal emotions will always be found; values can never be done away with, and no imaginable society could get along without its ideologies and utopias.[5] But, as was previously stated regarding values, these three forms of irrationality are far more subject to change of content and direction in the secular society than in the sacred society. This is another way of saying that there is nothing sacred about their content in the secular society.

The secular society, if realized to the full extent of its objective possibility, would provide a superb laboratory for the classical economist. Here he could test his postulates regarding supply and demand, marginal utility, diminishing returns, and so on, with the least possible interference from what he is pleased to call "extraneous factors." For cash is supreme in the secular society, and everything has its price, if not its buyer. No restrictions exist on the testamentary disposition of property, and to the highest possible degree a man may do with his own what he will. Trade, transportation, and markets are free and untrammeled and "boundless as the wish can claim." The so-called "cash nexus" truly comes into its own in the accessible secular society. It is this fact probably more than other which makes such men as Borsodi[6] cry out against the great metropolitan centers, some of which are at present our most secularized forms of society. And one type of individual personality which abounds in the secular society is well exemplified in such fictionalized accounts as those found in the popular I Can Get It for You Wholesale[7] and What Makes Sammy Run.[8]

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[5]For a thorough theoretical treatment of these last two terms the reader is recommended to Karl Mannheim's Ideology and Utopia (New York: Harcourt, Brace, 1936), and his more personally philosophical work, Man and Society in an Age of Reconstruction (London: Kegan Paul, 1940).

[6]Ralph Borsodi, This Ugly Civilization (New York: Harper and Bros., 1933).

[7]Jerome Weidman (New York: Simon and Schuster, 1937).

[8]Budd W. Schulberg (New York: Random House, 1941).

We have roughly drawn the outlines of some of the more important characteristics of both the isolated sacred society and the accessible secular society. Let us next focus upon the person who is in the process of becoming secularized. What are the prerequisites for secularization? What are the effects of secularization upon the individual human personality?

IV

Conservatives are isolationists, and those who are isolated, culturally speaking, are conservatives. It should now be abundantly clear that that society which contains a preponderance of sacred personalities is an isolated society, and that isolation is the most powerful bar to secularization. There are two forces, sometimes working in conjunction, sometimes separately, which may determine the degree of isolation of any particular society. One of these is the natural environment, including topography, climate, and soil fertility; the other is man himself. There are two principal ways in which the natural environment alone may impose isolation: the topography may be such that contact with other societies is extremely difficult, and the climate and/or soil fertility may be so disadvantageous that all available energy must be spent in wringing a subsistence from the environment--change might mean death. The force within man himself which may impose isolation on his society may be conveniently divided into what we can call fear, societal inertia, and interests of a vested nature.

For purposes of clarity the principal bars to secularization, that is, the forces imposing isolation, may be thus set down in outline form:

A. The natural environment.
   (1) Topography restricts population movement (physical mobility) and communication.
   (2) Disadvantageous climate or soil fertility leading to the necessity of a "bare-subsistence" or "marginal" economy.

B. The psychic and human environment.
   (1) Fear of change (neophobia).
   (2) Societal inertia--the force of long-established habit patterns.
   (3) Vested interests.

It is now necessary to hang a little meat on these too-bare bones. Leaving our constructed types in the background, let us now illustrate by pointing to a few actual

societies which for our purposes we can call highly sacred. Certainly, no given society is isolated only because of one of the above outlined factors, but we can, nevertheless, in the discussion of each point, pick out an example of an isolated sacred society in which one particular factor appears to be of paramount importance in the causation of the isolation which is found. The examples to be cited will be both historical and contemporary.

To locate a sacred society which owes its isolation in large measure to topographical features, all one needs to do is to survey the hidden and inaccessible valleys and islands of the world. There will be found the "lost societies," the "backwater" groups. Ancient and modern trade and communication routes have cut around these areas on their way to regions where contact is more profitable and where the terrain is not so inhospitable. This type of sacred society has always facinated those minds who, caught in the web of rapid cultural change, long for escape. They pine for escape from "man-as-he-is" to "man-as-he-should-be," and fancy often places these longed-for utopias in the "lost" parts of the world. No explorations, however painstaking, have yet located an Erewhon, and Atlantis, or a Shangri-La, nor are approximations of such figments of the imagination ever likely to be found. Instead, we come across the Tibetans, the Seminoles of the Florida swamp, the Indians of the upper Amazon, the inhabitants of the Outer Hebrides,[9] and others. Isolated from the constant stimulation of outside cultural contact, they tend to continue to maintain the ways of their ancestors. There is no need to be as pessimistic as was G. Elliot Smith concerning the distribution of inventiveness among mankind, but it is revealing to observe the almost incredible slowness with which new techniques are invented and adopted in physically isolated societies.[10]

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[9]The Hebrides make a particularly interesting example of this type of isolation because of their relatively close proximity --in miles--to great centers of secularization. For an illuminating account of some of the ways of life and techniques of the inhabitants of these islands, see: E. Cecil Curwen, "The Hebrides: A Cultural Backwater," Antiquity (British), Sept., 1938, pp. 261-289.

[10]The well-known folk-saying to the effect that "necessity is the mother of invention" has been expanded by Arnold J. Toynbee in his A Study of History to his Challenge-Response theory of the Genesis of Civilizations (see especially Volume II). Perhaps the proper "challenge" has been lacking to evoke the response of inventiveness in these physically isolated societies.

The most usual examples offered of sacred societies whose isolation has been reinforced by poor climate or soil are the Arunta of Australia and various Eskimo groups of the polar north. Over centuries of time these societies have lived in an ecological relationship with their environment at a level barely above that of simple subsistence.[11] The traditional ways of life have been tested and found to be adequate to maintain the life cycle--else long since the society would have become extinct. New ways are untried ways, and new ways, if tried, may literally mean death if they should fail in their purpose. Hence the aversion to the new and the firm grasp on the old. Such would-be innovators as may exist in societies of this sort are generally held in line by ridicule, but, if this fails, the threat of banishment from the society is more effective.[12]

Neophobia may have its roots in the actual danger of death which experimentation--the trial of new ways--might bring. More often, however, it will be founded upon such fears as fear of displeasing the sacred ancestors, the temporal rulers, one's fellows, or one's gods. Such fear is inculcated by the medicine men, shamans, or priests, and by the potentate, chief, king, or dictator. It is thus closely bound with the isolation imposed by vested interests, but many a shaman and many a priest is just as affected by the fear of offending the sacred ancestors as are the ordinary members of the society. In some societies this fear is undoubtedly a hold-over from those times when a marginal subsistence relationship existed between them and their environment.[13]

"Societies which impress upon their members habits

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[11] A remarkably well-done reconstruction of the culture of an American isolated group of this type has recently been provided by Jack S. Harris, "The White Knife Shoshoni of Nevada," Chap. 2 of Ralph Linton (ed.), Acculturation in Seven American Indian Tribes (New York: D. Appleton-Century, 1940).

[12] Writes Becker: "The rebel is an outcast, and the outcast quickly becomes a corpse" (unpub. MS.).

[13] In his scholarly La Pensée juridique et morale en Grece (Paris: Leroux, 1917), Louis Gernet traces the evolution into Greek law of the ancient traditional principles of family and clan solidarity against a hostile environment. More definitely pointed toward showing the evolution of this solidarity from the family to the state is the work of Gustave Glotz, La Solidarité de la famille dans le droit criminel en Grèce (Paris: 1904). Durkheimian influence is evident in the work of both these men.

making for a high degree of resistance to change are sacred societies.[14] No one who has lived for any length of time among the members of a small isolated society can fail to be convinced of the force of habit, of sheer societal inertia, as a resistance to change. The first-hand account of Leonard and Loomis of the culture of El Cerrito is a valuable description of an isolated sacred society characterized by such societal inertia.[15]

In any society there are always members whose power rests upon the maintenance of the status quo. They represent vested interests against change, and they generally find that the most effective means of preventing the adoption of new ways of life is to keep the society, over which they have power, isolated from outside contact. One of the most interesting historical examples of the successful imposition of isolation upon a society from above is to be found in the story of the Incas of Peru. Although the many villages of the empire were connected by well-constructed roads (foot and llama paths) and bridges, only certain officially designated persons were permitted to travel over them.[16] There is a double purpose in choosing the Incan empire as an illustration of an isolated sacred society. Not only does it provide an example of isolation imposed and maintained by vested interests, but, as far as we know, there was a high degree of specialization of tasks within this society.[17] And it is thus evident that

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[14] Becker (unpub. MS.).

[15] Olen Leonard and C. P. Loomis, "Culture of a Contemporary Rural Community: El Cerrito, New Mexico," Rural Life Studies: I (November, 1941), U. S. Dept. of Agriculture, Bureau of Agricultural Economics. Also see: Charles P. Loomis, "Informal Groupings in a Spanish-American Village," Sociometry, IV, I, (February, 1941), pp. 36-51.

[16] In these respects at least, the legendary Chinese philosophical primitivist, Lao Tse, would have found the empire of the Incas pleasing. According to Barnes and Becker (Social Thought from Lore to Science, New York: D. C. Heath, 1938, Vol. I, p. 63) Lao Tse's philosophy of "not striving" advocated the imposition of an "isolation made so thorough that although his people could hear 'the crowing of cocks and the barking of dogs' in nearby villages, they would pass through life without knowing anything more of their neighbors, and thus would be kept healthy and peaceful."

[17] Although often questionable in its interpretation, reference may be made to Ogfrid von Haustein, The World of the Incas (London: Allen and Unwin, 1924).

there is no necessary correlation between the degree of division of labor practiced within a society and the degree of sacredness or secularity which it exhibits.

For the individual, the process of secularization means social contact with a more secularized society than the one in which he has been born and brought up. If the new society is too greatly different from the old or, otherwise put, if the two societies involved occupy widely separated points on our heuristic sacred-secular continuum, the individual will find it impossible to make complete readjustment during his lifetime. That is to say, processes of secularization involve the disturbance of one equilibrium and the final creation of a new equilibrium. It is the distance (in secularity, if you will) separating the relatively sacred society from the relatively secular society, to which movement is being made, that determines the intensity of the disequilibrium which must be overcome by the individual undergoing the change. If this disequilibrium is too intense, adjustment may never be made, and the individual personality may remain unadjusted, demoralized, and disorganized.[18]

Anything which contributes to the breaking-down of the forces leading to physical or mental isolation is an aid to secularization. It has already been pointed out several times that universal education, quick and easy transportation, and communication are the principal means by which widespread secularization is made possible. Communication sometimes makes it possible for the individual to become secularized--always in relative terms--without actually moving his place of residence. Transportation makes high mobility possible for the individual. He may go wherever he pleases as often as he pleases, and he may become secularized by moving from a uninucleated sacred society to a multi-nucleated secular society.[19]

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[18] A disorganized personality is not a secularized personality, for a highly secular person may be as well adjusted to the secular society as is the sacred person to the sacred society. A disorganized personality may, however, be a secularizing personality.

[19] If we should divide our continuum at the mid-point, and call all societies to the left sacred societies, and all societies to the right secular, it would be evident that the migration of a person from one society to another might involve one of four forms of necessary adjustment or strangeness: secular-to-secular, secular-to-sacred, sacred-to-sacred, and sacred-to-secular. Here we are focusing on the fourth form, i.e., the shift from sacred-to-secular. See Wiese-Becker, op. cit., pp. 318-26.

Although secularization is not synonymous with industrialization, there can be no doubt of the fact that the impetus given to the growth of huge cities, population mobility, and freedom of communication by the industrialization of our civilization has been a most important factor in the process of secularization. In one of his recent columns, Walter Lippmann writes: "The individual's own automobile has probably been the most revolutionary invention in the whole modern history of man. For it made the individual feel highly independent of his neighborhood and even of his community, and in making him a self-sufficient nomad it has done much to dissolve the ancient ties between men and the place where they belong, between men and the other men among whom they were born."[20] We are not here concerned with the soundness of Mr. Lippmann's conclusion that this "has been a mixed blessing," but only with the fact that his assertion regarding the individuating effect of the automobile in our American society is undoubtedly correct. The postal system, the radio, cinema, press, telegraph, telephone, airplane, bus, railroad, steamboat, bus, and even bicycles, and a host of others could also have been mentioned. Anything, anything at all, which can be used as a tool to further effective culture contact serves to emancipate men from the traditions and superstitions of their fathers and thus to secularize them.[21] Such emancipation may be ultimately most beneficial to mankind, as Lester Ward so definitely felt, or it may be detrimental, as Sorokin and others feel. We only point it out as a process which has long been dominant in our society. Others may judge its ultimate effects.

V

It is axiomatic that the more secularized a society has become the more difficult it is to maintain social control and order based on consensus of opinion. Traditional social control, in the sacred society, is self-maintaining and self-reinforcing, whereas rational social control, in the secular

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[20] The Chicago Sun (May 9, 1942), p. 7.

[21] Physical mobility--migration--is not, of itself, sufficient to "further effective culture contact." In addition there must be both a common universe of discourse and what may be termed mental mobility. Reference should be made to Becker's classification of the various forms of migration in his "Forms of Population Movement: Prolegomena to a Study of Mental Mobility," (op. cit.).

society, involves a continuous expenditure of energy. It is reasonable, therefore, that those who find themselves in a position to wield power are often tempted to counteract secularizing tendencies within the society over which they have control, and to substitute what we may call processes of sacralization. In the case of a ruler who has seized control of an atomizing, secularizing society and who must maintain his power and authority almost entirely by force, this situation becomes more than a temptation; it becomes imperative to dam up secularizing tendencies in order that a more effective rule may be established. Although naked force is probably the most certain means by which man can control man, it is also the most energy-consuming and inefficient form of social control which can be practiced. If an effective rule is to be established, and the need for coercion reduced, the ruler must attempt to make his power appear to be legitimatized by tradition. And for tradition to be effective, the society must be sacralized. It is therefore apparent that any dictator who perpetrates the error of encouraging secularization is encouraging his own eventual over-throw.

A display of naked force may enable a dictatorship to seize power over a secularizing society, but it is only by establishing the rule as sacred that the power can be maintained for any length of time. If for nothing more than to maintain his own power, a dictator, once he has seized control, must institute processes of sacralization as rapidly as possible. The ground must be immediately prepared to receive the sacred seeds; and fallow ground for sacralization can only be prepared by mentally isolating the members of the society which is to be sacralized. The first and foremost task, then, of such a dictatorship is to mentally isolate those over whom power is being exercised.

The Hitlerian dictatorship over Germany provides numerous examples of how this isolation in preparation for sacralization may be brought about. In listing some of these examples we are by no means aiming at completeness, but are simply interested in illustrating certain prominent means of providing for the mental isolation of the inhabitants of a national society.[22]

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[22]Outside of the multitude of provocative suggestions which can be gleaned from the Nazi bible itself, Mein Kampf, there are numerous volumes, some superior to others, which provide analyses of the German situation. Reference may be made here to such books as, Frederick L. Schuman, The Nazi Dictatorship (New York: Knopf, 1935); Wallace R. Deuel, People Under Hitler (New York: Harcourt,

Travel. Free movement of the population, both within and without the national boundaries, must be closely restricted. Passports are only to be given to those who can be relied upon not to attempt to disseminate new ideas upon their return to the country. Freedom of movement within the country may be restricted by the use of identification and labor cards, and the necessity of obtaining official permission to travel from place to place. The use of all means of public and private conveyance must be restricted to those whom the authorities deem it safe to allow to travel. Furthermore, travel on the part of foreigners within the country must be prevented as much as possible.

Communication. All means of communication must be under the direct control of the dictatorship. The theater, under whatever guise, must be under strong and vigilant censorship. The reception of radio broadcasts from abroad must be prohibited. Likewise, telephone and telegraph communication abroad must be permitted only to certain authorities and their agents; and subscription to foreign printed media must be prohibited. All public speeches, and printed matter of all kinds must be closely regulated. Even the content of private conversations must be controlled as much as possible.

Education. Education is communication par excellence inasmuch as it is the means by which the ideals and ideas of the society are transmitted to the young. Since in this case the ideals and ideas of the society are those of the dictatorship, nothing which might be at variance with them is to be taught in the schools. With the exception of the field of the physical sciences, the freely inquiring mind is to be tabooed and prevented from development. The social sciences cease to be science at all and become simply the springboard by which the social opinions of those in power are inculcated. History, economics, sociology, anthropology, etc., must all be re-fashioned in terms of absolutes which are open to no further question or inquiry. Universities and colleges must be

(footnote cont'd.)

Brace, 1942); Clifford Kirkpatrick, Nazi Germany: Its Women and Family Life (New York: Bobbs, Merrill, 1938), and Hermann Rauschning, The Revolution of Nihilism (New York: Longmans, Green, 1939). Unbiased personal data on Hitler himself are difficult to obtain. Nevertheless, although avowedly biased, the following two books are valuable for their presentation of the Hitlerian background: Konrad Heiden, Hitler, translated by Winifred Ray (New York: Knopf, 1936); and Rudolf Olden, Hitler, translated by Walter Ettinghausen (New York: Covici-Friede, 1936).

reduced in number, those which are allowed to continue must be entirely subservient to the political power, and the students must be highly selected on a sacralized basis.

Religion. All religions with foreign connections must be abandoned. A national supernaturalism must be erected which only propounds those ideas favorable to the continuation and perpetuation of the dictatorial rule.

The Family. The large patriarchal family must be encouraged in every way; the pater familias must indoctrinate his children with the sacred traditional ways. In rural areas at least, boys must be made to feel that the occupation and status of their father is the most honorable one to assume.

The Iconoclasts. At the outset of the dictatorship it was apparent that many thousands of inhabitants, for one reason or another, could never be made to "see the light" after any amount of propagandization and indoctrination. That is, they were too mentally mobile to be made amenable to mentally isolating measures and edicts. These "irredeemables" had to be excised from the social body in order that the purposes of the dictatorship might not be subverted. Concentration camps and the ax, the isolation ward and the scalpel, were the means by which these persons were themselves isolated from the isolated society.

Once a satisfactory degree of mental isolation has been achieved, the use of force internally as a regulatory device can be relaxed, and the dictatorship can achieve legitimacy by seemingly becoming an integral part of a great body of tradition which has either been genuinely revived or spuriously invented. Max Weber[23] speaks of "three pure types of legitimate authority" which he terms rational authority, traditional authority, and charismatic authority. In the particular instance of Nazi Germany we have a genuinely charismatic leader as dictator. This quality of a dictator is a helpful, although not necessary, prerequisite to the institution of processes of sacralization. From our present point of view, the charisma which Hitler undoubtedly possesses becomes important only insofar as attempts are made to routinize it and make such type of leadership traditional in the society and therefore legitimate.[24]

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[23] Op. cit.

[24] The grounds of charismatic authority rest on the belief in the "specific and exceptional sanctity, heroism or exemplary character" of the leader by his followers. Insight into the routinization of charismatic authority in Nazi Germany is well exemplified in Robert Schmid's "German Youth Movements: A Typological Study" (unpub. doctoral dissertation, University of Wisconsin, 1941).

With the advent of World War II we find ourselves in the midst of the most widespread and destructive clash of ideologies which history has yet recorded. In such a situation it may appear anomalous at first glance when it is stated that Nazi society is currently more sacred than American society. If it does seem anomalous, it is nothing more than an illustration of the loading which words may acquire from their use in varying contexts. In this paper we have attempted nothing more than to sketch out a frame of reference within which various societies may be analyzed and compared. We end with the warning: "No value-judgments implied!"

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A METHOD FOR INVESTIGATING INDIVIDUAL AND GROUP IDEOLOGY

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Questionnaires have fallen into disrepute with a considerable number of psychologists, and with good reason. In studies of motivation, actual behavior observation under experimentally controlled conditions is increasingly replacing the asking of questions. Even in the realm of "values" and "culture," the recording of behavior is stressed.

There is, however, one aspect of culture in which questioning might be the best, or at least, one of the most direct ways of investigation--the field of "official" ideology. The ideological front for a given individual may be very different from those values which "actually" guide his behavior.[1] Nevertheless, for individuals and for groups alike, differences in "official" ideology are of considerable importance in explaining differences in behavior.

The simplest way to get at "official" ideology is to create a situation which evokes this ideology and then to ask questions of the "subject" in a way that sufficiently restrains and at the same time allows freedom for varied reaction.

To understand the ideologies and "attitudes" which guide behavior it is not enough to know the content of the values. For instance, the fact that dancing is considered undesirable or that working hard is considered desirable is only one aspect of a system of values. A second, not less important aspect, is the way these different areas are connected in the culture of this group. For example, in some "cultures," such as the Calvinist, work is very closely related to religious values.

Questions of connectedness are not new in psychology. They are essential in problems of need, satisfaction, or substitution, and for the social-psychological problems of the

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[1]Schank has distinguished between "public" and "private" attitudes. One may have to go a step further and distinguish "official" public ideology from "official" private ideology. Both may differ from public behavior and private behavior. (Schank, Richard Louis, Psychological Monographs, Vol. 43, No. 195, 1932, p. 8.)

relation between members of a group. Questions of connectedness can be handled partly by means of that branch of geometry known as topology. The following method tries to probe into both the content and the topology of "attitudes."

As a result of the social process in which the individual acquires the ideologies of his group, certain "categories of behavior" emerge for him, such as "behavior-which-is-disapproved." Coordinated to the specific behaviors included in these categories are sources of "approval" and "disapproval." The purpose of this paper is to describe a method for investigating the content of these categories of behavior, for determining the sources of approval and disapproval connected with different behaviors within the categories, and for discovering the nature of the organization of the content and of the "sources." The application of this method should enable the experimenter to answer the questions (a) what specific behaviors are included in a specified behavior-category, (b) what are the sources of approval and disapproval for these specific behaviors, and (c) in what way are they related to one another.

The content of a category of behavior as well as the sources, or to use the sociological term, the surrogates, will depend upon the total social situation of the individual or group under investigation. The application of this method to different cultures should yield data which would reflect those differences. In a study by Kalhorn[2] of Mennonite children in Iowa the application of this method revealed some interesting differences between the Mennonite and the non-Mennonite samples.

Of all the Mennonite children mentioning religious activities as a type of approved conduct, the largest percentage gave Deity as the surrogate (50%). Among the non-Mennonite children the largest percentage (53%) gave Everyone. Only fifteen percent of these non-Mennonite children gave Deity. Of the Mennonite children only seventeen percent gave Everyone. Kalhorn concludes, "This seems to indicate that religion in the non-Mennonites is closely related to the area of social affairs which are to be approved by society in general, while in the Mennonite group, religion has a more direct relation to God."

Differences of content in the categories of approval and disapproval, and differences in the sources of approval and disapproval are also to be found within one culture at

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[2] Kalhorn, Joan, "Ideological Differences Among Rural Children," Master's Thesis, State University of Iowa, 1941.

different age levels. The development of the relationships between content and surrogates is a particularly interesting phase of ideology. It was for the purpose of studying this problem in the specific area of school behavior that this method was originally designed. As an illustration of a cross-sectional study, and to clarify the method as such, this first and simplest application will be described in detail.

Although the test can be given individually to children as young as four years of age, it was decided to limit the school sample to the pupils of the fourth to the eighth grades, and to use a group testing procedure. Two schools were chosen: (A) a parochial school in a small town and (B) a consolidated school in another small town. Grade four was chosen as the lower limit because the handwriting was illegible in the third grade. The test was given to one grade at a time, preferably in the "home room." The teacher was asked to stay in the room, and the children were asked to put their name, age, grade, and school at the top of the paper. This was done to keep as much as possible the "school atmosphere," the ideology of which was the objective of the test. The experimenter explained that what was to follow was not a test, and that any answer was correct, but that the best answer was what the child really thought.

The first question was, "What could a child of your age do at school that would be a good thing to do and someone would praise him?" When the children had answered the question, the experimenter asked, "Who would praise him?" This unit was repeated three times, the second and third time the child being asked, "What else could a child of your age do and someone would praise him?" On the fourth repetition the experimenter changed the statement by inserting the adjective "very" before the word "good," and by changing the second half of the question to read, "Who would praise him very much?" On the seventh repetition the experimenter read two "very's" where one had been. In all, there were nine repetitions of the question asking for praisable activity. This unit of praise questions was followed by a unit of nine scold questions phrased in a corresponding manner.

It will be noticed that the wording of the questions is such as to avoid direct query about the person's own behavior or values. Instead, the indirect method of asking about the behavior and values "of a child of your age" is used. This gives the individual freedom to answer in a way which on the surface merely states what he (the subject) considers to be the behavior and values of his age group. In other words,

the question asks for the values of the group without inquiring whether or not the individual agrees with the group. It is, however, the assumption of the experimenter that by and large, the subject will give his own point of view. The situation is in this respect similar to projective methods where the child is asked to set up "a family situation" and it is expected that he will actually reproduce his own family situation. It seems that the indirect method actually solicits more open and personal answers by setting up a situation which from the subject's point of view is impersonal. Pains are taken to produce such an "easy" atmosphere by the proper introductions of the questions. In the study described above, the children were told that the experimenter was making a picture book about American children just like themselves, and that this book was going to be given to some Mexican children. The experimenter asked for help from the children in selecting the topics to go into this book. Such an introduction raises the interests of the children and removes the questions from the level where the child might be afraid of criticism for what he says. Similar procedures are possible for adult groups. In a study of minorities, the subjects were approached in the following way: "A group interested in the betterment of majority-minority relations wishes to get information about the opinion of as many types of people as possible so that they can proceed on a democratic basis. I have been asked to help in the canvas and would like you to help by stating your opinion." In this way the person becomes sufficiently involved and at the same time is made secure against criticism.

Very briefly, the results of the study with the school children showed that while in the fourth grade praisable activity lay in doing the work the teacher assigned and in not creating discipline problems, this response drops out steadily until it comprises less than two percent of the answers in the seventh and eighth grades. Instead, excelling or doing better than anyone else, and doing a "great" or "noble" deed rise from almost zero percent of the answers in the fourth grade to thirty and forty percent respectively in the seventh and eighth grade.

As to the sources of approval and disapproval, reference to another individual child as a source of praise starts at about fifty-five percent in the fourth grade, drops sharply to about twenty percent at the sixth grade, and down to about one percent at the eighth grade. As a source of scolding, the other individual child is mentioned in about the thirty percent of the answers in the fourth grade, dropping to about five

percent at the sixth grade and remaining at or below that figure through the seventh and eighth grades (Fig. 1). Other surrogates, the teacher, the principal--show equally definite patterns from grade to grade (Figs. 2, 3).

It is obvious from the foregoing that this test consists of asking the subject to name a specific behavior which fulfills the conditions a, b, c,....n, laid down by the experimenter, and to identify one or more or those conditions. In the study of the "approved" and "disapproved" school behavior reported above, the conditions were three: first, that the behavior be a praisable activity; second, that it be activity in school; and third, that there would be praise from some source if that activity were performed. The subject was required to name the activity which fulfilled these conditions, and to identify the source from which the praise would come.

In using this method, the experimenter must determine to what extent the problem situation should be defined, and how general or specific to make the defining "conditions." In other words, this method can be used to investigate the ideology related to a specific area of the individual or group life or related to broader areas, or related to the whole outlook on life.

In a preliminary study of pre-school children where it was desired to learn to what extent the doing of praisable things and the receiving of praise fell into any particular area of the child's life space, the question was put in very general terms. The specific activity which the child was asked to name had to fulfill only two conditions: that of being praisable, and that of being praised by someone. The results showed that with these children of this rather progressive school a clear connection existed between praisable activity and school, and scoldable activity and home. It is interesting, also, to note that the school activities which the child recognized as praisable were all of a creative character, and the scoldable activities associated with home were almost entirely property-destroying activities.

One thing is certain; the fewer the defining conditions, and the more general the related area, the more difficult will the interpretation of the data be. On the other hand, the exploratory stages of an investigation into a "new" territory are more likely to be rich in clues if the approach is sufficiently general.

A good example of a problem which by its very nature required a rather specific setting is one recently begun by the author. The subjects were the members of a

AN INDIVIDUAL CHILD AS SOURCE

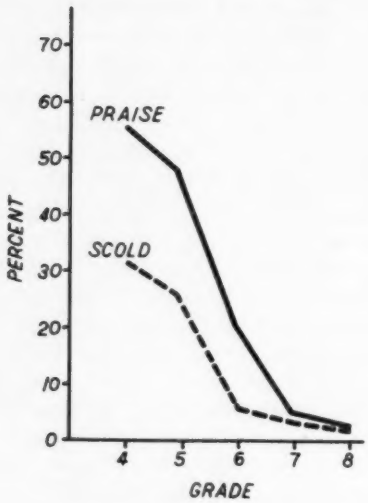

Fig. 1

THE TEACHER AS SOURCE

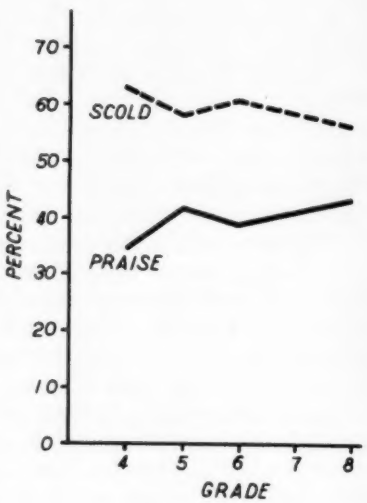

Fig. 2

PRINCIPAL AS SOURCE

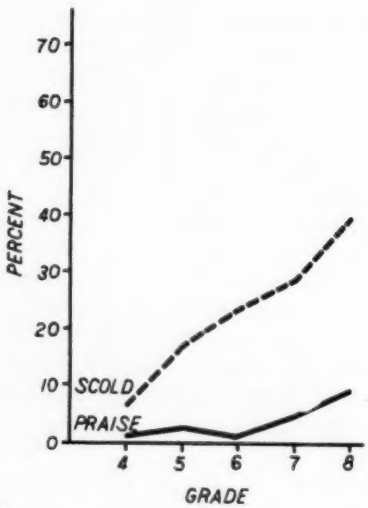

Fig. 3

pre-adolescent girls' play group. The purpose of the investigator was to discover those areas in which the ideologies of the group and those of the surrounding social environment overlapped in a conflicting manner. The praise and scold questions were worded in the following way: "What is a good thing to do and someone will praise you, but your girl friends in the club will scold you?" and "What is a bad thing to do and someone will scold you, but your girl friends in the club will praise you?" The subjects were taken singly and not permitted to communicate with each other until all had answered the questions.

Typical answers to the questions for "good" behavior which the club would scold were "Not talking back to the teacher," "If a girl had to go up to the bathroom and her house was locked, let her go up to your house." The source of praise was always the parents of the group.

Typical answers to the questions asking for "bad" behavior which the club would praise were "Yell at the girls' mothers," "If they didn't like a man spit in his face," "If they hated to wear glasses break them for them," "If they had to go to the bathroom and her house was locked tell her to go outside and leave her pants off." The adult who would scold was in every case a parent.

Another aspect of this method which the experimenter must consider with care is the effect which the character of the experimenter and the immediate situation have on the results. In the study of school behavior mentioned above, the experimenter was an adult, and was seen by the children as probably belonging to the "teacher" group. By asking the teacher to remain in the room, and by asking the children to put their name, grade, and school on the paper, the experimenter sought to strengthen this atmosphere to the point that it could be reasonably expected that the answers would be the kind which the children believed would receive approval by the "teacher-adult" group. No general statement can be made about the effect of the experimenter on the results, since in a large measure this depends upon the nature of the group.

The analysis of the data collected by this test consists of categorizing the responses and tabulating them, if possible with the help of card sorting machines, into different frames of reference.

The method described above has been adapted to investigate problems of Jewish-Gentile relations, Boy Scout ideology and is being adapted for use in an investigation of food habits.

A SECOND EXPERIMENT ON INTERVIEWER BIAS

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In the May issue of Sociometry Frank Stanton and Kenneth Baker reported their findings on an experiment in interviewer bias.[1] The present paper reports on a duplication of this experiment.[2] The results of our experiment do not corroborate the ones obtained by Stanton and Baker.

The hypotheses that were tested by Stanton and Baker, stated in the null form, are as follows: "(1) The bias of the interviewer has no effect in the personal interview when the direction of the bias is shown to the interviewer and when the interviewer is warned against it. (2) Interviewer bias has no differential effect upon the recall of incompletely learned material when the recall is measured at different points on the forgetting curve. (3) It follows that there are no individual differences in the effect of the bias from interviewer to interviewer."[3]

In order to test these hypotheses a controlled situation was set up. Groups of students were shown twelve geometrical nonsense figures that had no relationship to anything encountered in everyday experience. After the exposure to the material, appointments were made for individual interviews that were to take place several days later. It was explained to the students that this was an experiment to test recall of the figures.

Experienced interviewers interviewed the subjects. The interviewers were told that the experiment was concerned with the development of concepts and language forms.

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[1]Frank Stanton and Kenneth Baker, "Interviewer-Bias and the Recall of Incompletely Learned Material"--Sociometry, Vol. 5, No. 2, May 1942, p. 123-134.

[2]The experiment was conducted at the suggestion and under the general supervision of George A. Lundberg, to whom acknowledgments are due.

[3]Stanton and Baker, op. cit., p. 123.

The material used in the interviewing situation consisted of four sets of cards. On each card was drawn two figures, the one on the left being the figure that had originally been shown to the subjects while the one on the right was its mirror image. The twelve figures were arranged in this manner. Two sets of cards were the same, while for the other two sets the figures on each card were in the reverse order, the mirror image on the left and the original figure on the right. This was to counteract right-left preferences. The left-hand figure was always labelled "A" and the right-hand one "B". The interviewers were given score sheets with the "key" printed in prominent letters on the top. The "key" consisted of the "correct answers" for the cards. Each set of cards had a separate score sheet since the duplicated sets of cards had the "key" reversed for each figure. Stanton and Baker had the interviewers distinguish the four sets of cards and their respective score sheets by means of numbers. In our experiment we had a color correspond to each set of cards and its "key," using four different colors.

Half the answers in the "key" were correct, that is in terms of what had actually been presented to the classes, while half were incorrect. The interviewer, of course, assumed that all the "keys" were correct. The experiment assumed that the interviewer would be biased by knowing what he assumed to be the correct answer to each inquiry made of the student. The interviewers were told to show each card to the subject, ask him which figure he had seen in class and then to record the response on the score sheet that corresponded to that card. They were also told to shuffle the cards before each interview.[4]

Stanton and Baker interviewed the subjects twice, four days and eighteen days, respectively, after the original presentation. In our experiment we had only one interview. It took place one week after the original exposure.

The results obtained by Stanton and Baker justified their drawing the following conclusions: "(1) The bias of the interviewer exerts some determining effect upon the outcome of the interview even when the interviewer is experienced, the direction of the bias is shown to him, and the material has no personal or emotional connotation. (2) The effect of the bias is more pronounced upon the incompletely learned or remembered material. (3) The data do not justify a conclusion

[4]For full details of the experiment see the original article by Stanton and Baker, op. cit.

regarding individual differences in the effect of the bias among experienced interviewers."[5]

Except for a few minor details the same procedure was followed in the present experiment. The figures were presented on pieces of white cardboard 20" x 28", instead of being projected on a screen. Since we were limited by a small student body we used 100 subjects instead of 200 subjects. It was thought advisable to have only one interview instead of two as there was some danger that a considerable number would not have appeared at a second interview.

The interviewers used were four Bennington students who had had experience interviewing in surveys conducted by a class on that subject. The experimenter felt that their interest and objectivity would counteract possible influences that might arise due to the interviewers being well acquainted with most of the subjects.

Other than the above mentioned differences the procedure followed was the same as the experiment of Stanton and Baker.

The answers obtained from the interviews were divided into two groups: (1) Those which were correct in terms of the bias, i.e., the "key" that the interviewer had, and also correct in terms of the figures that were actually presented to the classes; (2) Those that were correct in terms of what had actually been presented to the classes but incorrect in terms of the interviewers' "key." Table I shows the percent of correct responses of the total number of judgments made for each figure.

Table I

Percent of Correct Responses Which Were In Agreement with and Contrary to the Bias of the Interviewer

	Figure											
	1	2	3	4	5	6	7	8	9	10	11	12	Mean
WITH BIAS	62.0	50.5	73.0	64.5	66.0	66.5	53.5	74.0	73.0	57.5	49.0	47.5	61.4
AGAINST BIAS	65.5	57.0	71.0	66.5	68.5	61.5	51.0	75.5	66.0	58.5	49.5	41.5	61.0
DIFFERENCE	-3.5	-6.5	2.0	-2.0	-2.5	5.0	2.5	-1.5	7.0	-1.0	-.5	6.0	.4

[5] Stanton and Baker, op. cit., p. 134.

The (t) test of the significance of the difference in the two means was used. For a difference of .4% the value of (t) is .34. An absolute value of a (t) of this size would be found between 70% and 80% of the time, in random samples. Therefore we may be reasonably confident that the observed difference is due entirely to chance.

Our findings therefore do not confirm those of the experiment in question.

SCHEMA FOR STUDYING THE SOCIAL EFFECTS OF INVENTIONS

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It is fairly obvious that society as a complex of social relationships never stands still; it is in a perennial state of activity. The alterations in the nature, content, and structure of groups and institutions, and in the relationships among men, groups, and institutions during a sequence of time, constitutes the field of social change.

Social change today is to be thought of as a continuous, rapid process. This does not imply that the rate of social change is always the same. There were periods of history in which social change appeared to have been quite slow. However, in contrast to geological or biological changes, social transformations often occur with amazing celerity.

In this paper we are concerned with the relationship between inventions and social change. This is not to deny that physico-environmental, as well as biological factors play a part in bringing about changes in society. Biological and environmental factors are involved, and to some extent, are responsible for society being what it is. Man has always had to adjust himself to his physical and biological circumstances. Periods of drought, warm winters in normally cold areas, dust storms, may be responsible for an altered mode of behavior in a particular locality. Biological factors, such as disease, death, population density, prevalence of organic life, racial crossing, and so on, exert their influences upon social life. Social change therefore, is to be thought of as resulting from a combination of physical, biological, and cultural factors which interact with each other.

It is possible to study social change from the point of view of each of these factors, separately. In the late nineteenth century, the evolutionists developed a theory of social change in harmony with the theory of cosmic and biological evolution. Spencer believed that social evolution was part of a purely "natural" process operating throughout the cosmic universe and consisted of a movement from the simple to the complex and from the homogeneous to the heterogeneous

brought about by the double process of integration and disintegration.

Following Spencer, a group of thinkers who have been called "social Darwinists" formulated another theory of social evolution. Included in this group were Benjamin Kidd, Jacques Novicow, G. Vacher de Lapouge, and Otto von Ammon. In general, their theory was that biological change determined social change. Social progress hinged on biological factors.

The geographic determinists, another group of the nineteenth and twentieth centuries, correlated climatic and topographic conditions with human progress. H. T. Buckle, Karl Ritter, F. G. Ratzel, Ellen Semple, and Ellsworth Huntington were the foremost exponents of this school of thought.

However, abrupt and uneven social changes and the rapidity with which our society undergoes alteration challenged the notion of the social evolutionary process. Rather, significant social changes were conceived of as resulting from cultural innovations, or inventions. Social change which occurs through inventions, consists of the adjustments society has made and is making to cultural innovations.

By invention is meant the creation or the discovery of a new culture trait or element. It springs from a new combination and manipulation of already existing cultural elements. Social change takes place because of the introduction of this new element. Invention consists of the "process by which man modifies his relationship to some phase of his environment."[1] It is a contrivance of that which did not before exist in the same form, although most of the constituent elements were there.

Inventions tend to answer the needs of man. Some inventions answer a widespread need, while others fulfill a narrower need. But the demand for an aeroplane for example, does not produce the aeroplane until various prior elemental inventions, such as the light motor, or refined gasoline, become realized. Therefore, in addition to the need (or what Ogburn terms social valuation), inventions are dependent upon an invention-base or on the elements necessary in the formation of the new invention.

Inventiveness, or inherent mental ability is a third essential in the formation of new inventions. Finally, tradition, or an existing social tendency or fashion of invention, may be considered a fourth factor in the origin of inventions.

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[1] L. L. Bernard, "Inventions and Social Progress," American Journal of Sociology. Vol. 29 (1923-24) p. 20.

All four elements--need, cultural base, mental ability, tradition, seem to be necessary for invention.

The origin, growth, and social influences of inventions are all problems related to social change. Much has been written on the first two. Our concern is with the last problem.[2]

Types of Inventions

Inventions can be classified into three groups: (1) in accordance with the degree of influence they exert after they occur; (2) in accordance with the notions of invention-combinations and invention-configurations (these concepts are explained below); (3) in accordance with the fields or universes of knowledge in which they occur.

Under (1) are found inventions ranging from those which have very important influences--or major inventions--to those of lesser and least importance--or minor inventions. By a major invention is meant the creation and appearance of a new element which could be considered revolutionary when compared to any part of the cumulative series of traits that took part in the development of this invention. The skyscraper, consisting of such inventions as the elevator, structural steel, mechanical sewerage system, could be considered a major invention because of the consequent train of events following its adoption.

By minor inventions are meant the myriad of improvements or additions that usually occur after a major invention. Differently shaped skyscrapers, varied heights, different facades, perfected elevators, are illustrations of minor inventions. A minor invention is also one that does not lead to any or many subsequent improvements, such as for example, the shoelace.

By invention-combination (under 2) is meant the combination of the various inventions and contrivances that were brought together to form one major invention such as the elevator. There are many kinds of elevators. However, although they are different, they retain a common fundamental similarity, and it is this that permits us to refer to it as an invention-combination--a major invention which, though it may vary

[2]Social influence is here used to signify a relation or interrelation between invention and society. It does not necessarily signify a causal connection between the two. It connotes the forms of adjustments society has made to the invention.

in form, retains its fundamental characteristics and structure consisting of a combination or fusion of other inventions.

By invention-configuration is meant the cluster of inventions that tend to be related to each other in so far as several different and independent inventions converge and in doing so bring about a pattern of inventions. It consists of a group of associated inventions that make up a cultural pattern. The automobile-configuration consists of many cooperating inventions such as the automobile, the gasoline station, hard-surfaced roads, the trailer camp, and so on. The college women's configuration consists of the pattern of sorority row women students, college campus, fashions, classroom, and so on.

Under (3) there might be included mechanical, social, pure aesthetic, method, or other inventions, falling under the accepted divisions and fields of knowledge in which they occur. Several writers (Ogburn, Wilson Wallis, Hobhouse, Wheeler, and Ginsberg) classify types of inventions in accordance with their dichotomous classification of culture, into material and non-material aspects. Mechanical invention may be defined as the creation of a new material or technological implement or tool. "It is a process by which, normally, the organism which directs the machine or device invented--not necessarily the inventor--employs natural forces to secure a better, that is, usually a more rapid and economical and more accurate adjustment to his physical environment."[3]

A social invention is an invention in the non-mechanical realm. Social inventions consist of the creation of new relationships between the individual and the group, and between groups, by the employment of social forces and social situations. Social inventions are related to social organization. In social invention, man manipulates man.[4] In mechanical invention, man manipulates nature. Examples of social inventions are old-age pensions, higher education for women.

Types of Influences and Processes Involved in the Framework of Adjustment

The intention of this paper is to report on a study that dealt with society's adjustment to a mechanical invention

[3] L. L. Bernard, op. cit., p. 6.

[4] The similarities or differences between a social invention or a mechanical invention might be discussed at great length. A social invention is here used as a new element in social organization.

(the elevator) and a social invention (higher education for women).[5] Two types of findings have been recorded. One group records the factual and specific results springing from society's adjustment to each of these inventions. The other consists of a conceptual framework; including generalizations as to types of influences and types of processes involved in the congerie of adjustments to these inventions. In this discussion the conceptual pattern of the social impingement of these inventions will be delineated and the factual findings will be cited as illustrative material only.

In dealing with the influences of inventions on society, some writers have pointed out that social change is the result of individual and psychological factors rather than the result of inventions. R. M. MacIver has said that the social process, and particularly social change, comes about as a result of the active participation of individuals, consciously and intelligently adjusting themselves to environmental changes (inventions) rather than as a result of the passive adaptations of human beings to external forces.[6] Whatever one's point of view it should be quite obvious that inventions may be considered as necessary, though not sufficient conditions of social change. It will be pointed out that "response" (which is involved in the notion of volitional behavior) is one of the immediate processes and influences involved in determining the social consequences of inventions. In fact, the problem of social adjustment to inventions involves three general avenues of inquiry: the social response to the invention which determines and precedes its adoption, the types of processes in operation, and the type of influences resulting.

In general, the relation of social change to inventions may be thought of from the standpoint of primary and derivative influences.[7] By primary influences are meant those immediate results brought about by the first contacts that an invention makes with an individual, a number of individuals, or a group. By derivative influences are meant the changes that occur in a series of events following each other as links in a chain.

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[5]Joseph B. Gittler, "Society's Adjustment to a Mechanical and a Social Invention," Ph.D. dissertation, University of Chicago, 1941.

[6]R. M. MacIver, Society: Its Structure and Changes. (New York: Farrar and Rinehart, 1936) pp. 525 ff

[7]The writer is indebted to W. F. Ogburn for these concepts.

The study singled out two types of immediate influences, immediate social influences and immediate inventional influences. The former consists of the immediate effects an invention has on the attitudes, habits, and customs of a number of individuals or groups. It involves three further aspects which can be characterized by the concepts of response, adoption, and natural consequence.

The influence of an invention on society is a function of the degree of its adoption. The extent of adoption determines the degree of social change, because to the extent that society adopts an invention--to the extent that an invention spreads through and is used by the members of a group--to that extent it has changed the mode and content of the life of the group from its previously existent, pre-adoptive state. The adoption of an invention adds to, replaces part of, or supplements the culture of a society.

Adoption may be understood from the standpoint of the horizontal spread of the number of units of an invention and from the use that is made of the invention. Thus the use made of the elevator is that of vertical transportation; that of higher education for women, just what it implies.

Both "spread and use" are polar phenomena; each is a function of the other. However, the number of persons making use of an invention is very apt to be greater than the number of units of the invention that were adopted. Thus the number of persons using the elevator for vertical transportation greatly exceeds the number of installed elevators; the number of women receiving a higher education is far greater than the number of colleges admitting women.

Furthermore, not only may use be thought of quantitatively--the number of users, but an invention may be used for various purposes. The varied uses that are made of an invention usually depends on the minor improvements or alterations that are appended to the invention without altering the fundamental nature of the invention. (Invention is here used synonymously with invention-combination). Thus elevators are used in department stores, hospitals, and warehouses. Each use required a slight variation in the elevator. Higher education for women may be used for professional or vocational preparation, for a general liberal education, or as a media for propaganda. Here again each use emphasizes one or more elements involved in the invention-combination higher education for women.

In the study we found that social adoption does not inevitably follow the invention; the advent of the inventions did

not lead to immediate adoption. Adoption followed only after a favorable social response or reception (another immediate social influence) and therefore, acceptance of the inventions. But there also arose resistance or actual opposition to the proposed and the actual adoption of the inventions. In fact, resistance may be found present in one form or another, to almost every invention. Adoption and acceptance follow after these resistances are overcome.

Several writers have attempted to isolate the reasons for resistance to the adoption of the inventions. W. F. Ogburn has accounted for ten general reasons for resistance to technological innovations.[8] Bernhard J. Stern discovered fourteen factors involved in society's resistance to medical innovations.[9]

In like manner, the two inventions dealt with in the study met with opposition. The discoverable reasons for resistance are fewer than those isolated by Ogburn or by Stern; but several of them were found. The elevator was resisted because of the lack of knowledge regarding its operation. It also was opposed on the ground of accidents and fear for personal safety. Lastly, the fact that the elevator occupies considerable rentable space acted as--and still does act--as an economic factor which curtails the indiscriminate spread of elevator office buildings.

The notion of derivative influences will be discussed in a later portion of this paper. It may suffice to note here that since the skyscraper springs from the elevator, any social influences of the skyscraper are considered derivative influences of the elevator. Thus, any resistance to the adoption of the skyscraper may be considered a derivative social influence of the elevator. Here again, it was found that fear of the new, economic factors, questions of personal safety and health are the outstanding reasons for society's resistance to the adoption of the skyscraper.

As for higher education for women, the study indicated that vigorous opposition to its spread was due to the belief that women were unfit for strenuous education; that their health would be impaired; that they lacked the innate capacity to learn complex subject matter; that they would lose all feminine appeal and charm; and that higher education would

[8]William F, Ogburn, "Technology and Society," mimeographed, p. 15 ff.

[9]Bernhard J. Stern, Social Factors in Medical Progress. (New York: Columbia University, 1927).

distract them from their natural function in life, motherhood.

In the resistance to the elevator, we have what Noss termed "passive resistance,"[10] that is, resistance which consisted of a mere refusal to accept the innovation. As for higher education for women, the resistance might be classified as "unorganized active resistance" to employ Noss's terms.[11]

John Henry Mueller, in his study, The Automobile: A Sociological Study, reduces to three types the processes involved in society's response to the automobile: (1) ordering and forbidding (this was an attempt to expel the foreign object); (2) exhortation and ridicule; and (3) toleration, criticism, and a scientific attitude.[12] These, he found, followed in a sequential chronological order to form what he termed an "hypothesis of the natural history of public opinion."

In the social response to the elevator there was no evidence of an attempt to eliminate it--that is, the first of Mueller's "process of response" was not present. The other two were discovered in the order expected. There was expressed ridicule to the operation of the elevator (see the response to Otis' exhibition of the working of his elevator) followed by a tolerant, objective attitude towards the elevator when various municipalities sought to minimize the possible resultant accidents by regular inspection.

Interestingly enough, the response to higher education for women manifested the same two processes as was found in the response to the elevator. First, college women were ostracized in "polite society" and were considered not "quite nice."[13] This is similar to Mueller's idea of exhortation and ridicule. Following this expression of resistance, higher education for women advanced to the stage of "toleration and criticism." Thus the empirical evidence in the study of two inventions validates, in a qualified degree, the findings of others in their studies of social response to inventions.

It should be noted that when the inventions (the elevator, higher education for women) were clamoring for adoption, their acceptance was dependent on a rational, deliberate choice. After initial social acceptance, further adoption

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[10]Theodore K. Noss, "Resistance to Social Innovations as Found in the Literature Regarding Innovations Which Have Proved Successful," Ph.D. dissertation, University of Chicago, 1940.

[11]Ibid.

[12]Ph.D. dissertation, University of Chicago, 1928, p. 173 ff.

[13]See Chapter 10.

proceeded more or less automatically, becoming impersonal and non-deliberative.

Often however a retardation in the process of adoption may arise after the invention has successfully spread. Thus the skyscraper met comparatively little resistance at the outset. After it became rather widely adopted, resistance arose which retarded its spread. This took the form of zoning laws, realization that unlimited height had economic drawbacks, and so on.

The spread of higher education for women gave no apparent sign of retardation even though new resistances came to the fore from time to time. However, although the figures indicate a steady increase in the number of college women, they do not of course mean that there was no retardation. New resistances were manifested. Whether they actually retarded the further adoption of higher education for women is, in this case, indeterminable.

So far we have characterized the immediate social influences of an invention as consisting of social response (involving resistance and acceptance) and social adoption (involving spread and use). Now the use of an invention may give rise to unplanned-for results that might be termed natural consequences. By natural are meant those effects that spring from the use of an invention that are not premeditated or planned for. No individual creation or origination is involved and no inventive activity is necessary. Thus elevator accidents were the natural accompaniments of the elevator's use. In the same way, skyscraper apartments are free from certain disease-carrying insects that reside in low altitudes. Similarly the natural consequence springing from the invention of physical education for women is healthier women. These are not inventions (healthier women, freedom from insects, accidents); they are inevitable consequences of particular inventions. Since use is one aspect of adoption and since a natural consequence springs from the use of an invention, it can be seen that a natural consequence constitutes a third kind of immediate social influence.

It was stated previously that there are two types of immediate influences, social and inventional. The former has been elaborated. With respect to the latter, we have an immediate inventional influence when an invention exerts an influence on other inventions which in turn may have social consequences.

Inventional influences may occur through the operation of several processes. One such process is that of fusion.

Here, several inventions combine with other inventions to produce an altogether new invention--the elevator, structural steel, water pressure inventions, all fused to form a skyscraper. Each of these inventions loses its identity, in a sense, and becomes part of a larger whole. The resultant invention then gives rise to social influences by manifesting processes of social response, social adoption, and by leading to possible natural consequences.

Second, a number of inventions may groove or jointly participate in exerting social influences. This forms an invention-configuration which, when adopted tends to produce its effects on society. Thus the skyscraper which resulted from a fusion of inventions, grooves with many other inventions such as transportation, centralization of industry, and so on, to form the urban-invention-configuration. Higher education for women, woman suffrage, feminism, groove to bring about social equality of women.

Whenever there is a grooving of inventions, there occurs a reciprocal re-enforcement of the adoption of the inventions which, involved in the grooving, may re-enforce a participating invention whose use gives rise to a natural consequence. For example, the use and spread of birth control inevitably makes for more infrequent conception. But another invention such as tall apartment dwellings or college education for women, although not directly responsible for small families, can act as a re-enforcement of another invention (contraception) making its use and adoption more widespread and consequently acting as an influence for smaller families.

At the very outset of our analysis the influences of inventions were classified as primary and derivative. It is now clear that the primary influences include:

A. Immediate social influences.
   1. Response.
      (a) Resistance.
      (b) Acceptance.
   2. Adoption.
      (a) Spread.
      (b) Use.
   3. Natural Consequences.

B. Immediate inventional influences may involve:
   1. Fusion.
   2. Grooving.
   3. Re-enforcement.

These are all immediate or primary influences because they flow directly from the focal inventions, the elevator

and higher education for women. There are however, inventional and social influences that may be thought of as being several "orders" or steps removed from the focal inventions. Thus the skyscraper which results "immediately" from a fusion of the elevator with other inventions can be characterized as an immediate inventional influence of the elevator. Living in the upper stories of skyscraper apartments has as a natural consequence, freedom from disease-carrying insects. Hence freedom from disease-carrying insects which is an immediate natural consequence of living in skyscraper apartments is in turn a derivative natural consequence (and social influence) of the first order of the elevator.

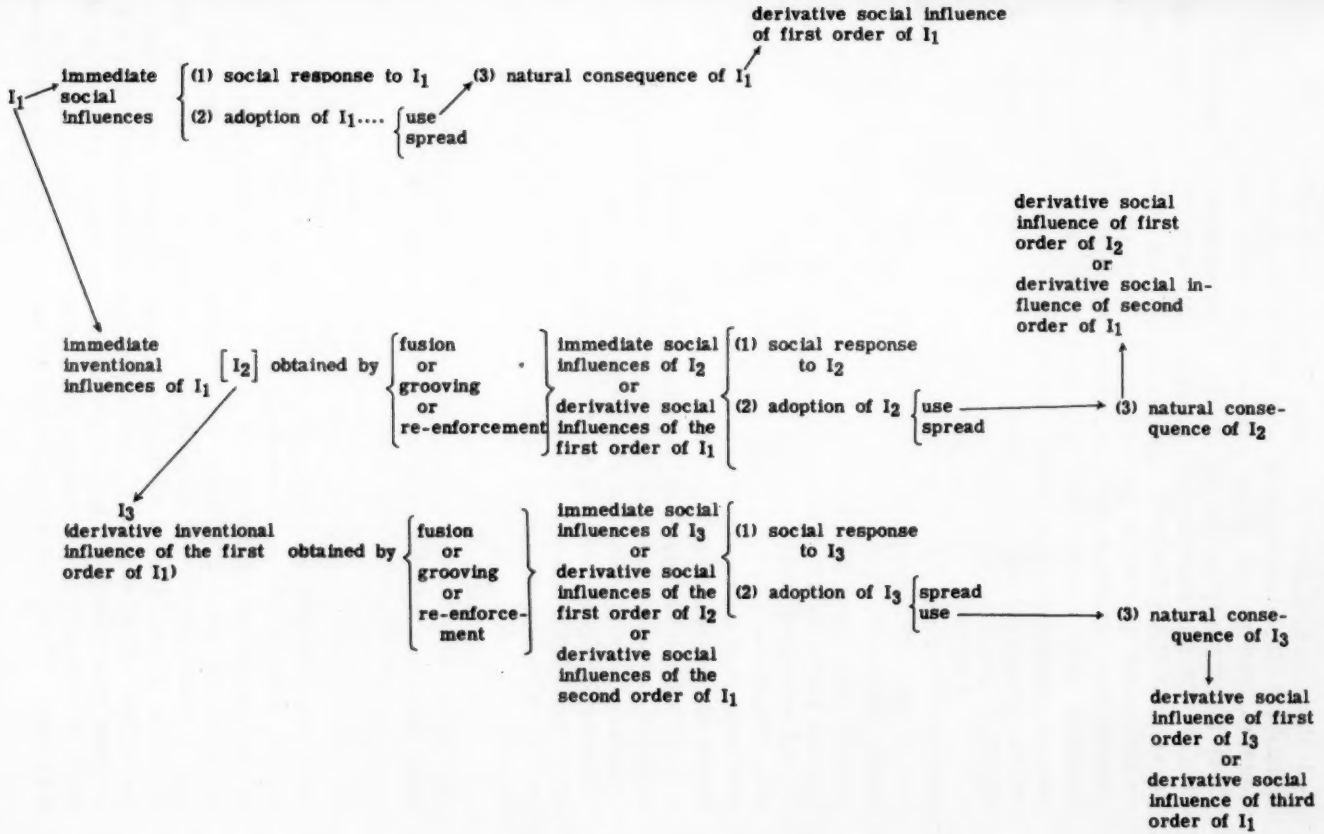
Furthermore, small families are a natural consequence of the use of contraception. It was found that living in skyscraper apartments re-enforces the use of contraception. Ergo, the small family which is the immediate natural consequence (an immediate social influence) of the use of contraception is a derivative natural consequence of the first order (a derivative social influence of the first order) of the use of the skyscraper dwelling (an immediate inventional influence of the elevator) and a derivative natural consequence of the second order of the elevator.

The same type of derivative influences was found to operate in connection with higher education for women. For example, low fertility is a natural consequence of a late marriage age. College education for women tends to postpone marriage to a later age. Thus, low fertility is a derivative natural consequence of the first order of higher education for women.

If we allow I_1 to stand for our focal invention and I_2 and I_3 for inventions derived from I, the following figure portrays diagrammatically, the above discussion:

Finally, ,we have found what might be termed a <u>reversible-derivative</u> process. Primary or immediate consequences of invention A consists of (1) the adoption (including response and natural consequences wherever present) of invention A, and (2) the new invention B springing from invention A by any of the above mentioned processes. A derivative social influence (of the first order) of invention A may be the adoption of invention B. If B leads to invention C, the adoption of invention C would be a derivative social influence (of the second order) of invention A, and so on. A derivative-reversible process consists of a derivative invention, which, when adopted tends to enhance or stimulate the spread of a prior-existing invention. Thus, the elevator led to tall buildings (skyscrapers)

derivative social influence


derivative social influence of first order of I_1
I_1
immediate social influences
(1) social response to I_1
(2) adoption of I_1....
use
spread
(3) natural consequence of I_1
derivative social influence of first order of I_2 or derivative social influence of second order of I_1
immediate inventional influences of I_1
$[I_2]$
obtained by
fusion or grooving or re-enforcement
immediate social influences of I_2 or derivative social influences of the first order of I_1
(1) social response to I_2
(2) adoption of I_2
use
spread
(3) natural consequence of I_2
I_3 (derivative inventional influence of the first order of I_1)
obtained by
fusion or grooving or re-enforcement
immediate social influences of I_3 or derivative social influences of the first order of I_2 or derivative social influences of the second order of I_1
(1) social response to I_3
(2) adoption of I_3
spread
use
(3) natural consequence of I_3
derivative social influence of first order of I_3 or derivative social influence of third order of I_1

which increased land values which in turn was responsible for the erection of more tall buildings to overcome the higher land values.

In conclusion, we wish to cite two additional types of influences found in the study: transient and permanent. This distinction is based on the duration of the influence involved. It was apparent that the opposition to the adoption of the elevator as well as the opposition to the adoption of higher education for women was relatively short-lived as compared with some of the lasting influences of each invention. The opposition to each invention has virtually disappeared. But while it existed it took on very concrete and meaningful manifestations. We can signify this influence on relative short duration as a transient influence.

In contrast to transient influences, we have permanent influences--those that are relatively lasting in point of time. The elevator has come to stay. Higher education for women is becoming increasingly widespread and there is little reason to think it will disappear.

Mechanical inventions and their influences on society have been studied to some degree. Many aspects of this problem have been recognized, written about, and discussed. Social inventions on the other hand, have been neglected to a great extent. Noting this unplowed field of social exploration, the writer selected a social invention along with his mechanical invention in order to see whether this neglect has been justifiable. In tracing out both these inventions, it was observed that they gave rise to very similar processes of social impingement. Indeed, the social invention seemed to have had as widespread consequences as the mechanical invention. This opens an interesting field for speculation as well as research since the emphasis has largely been upon the effects of mechanical invention on society.

These facts, concepts, and processes were discovered in the study of the impact of a mechanical invention (the elevator) and a social invention (higher education for women) on society. Whether these findings are characteristic of all inventions awaits further detailed study. The writer believes that many of these processes will be found in society's adjustment to most inventions. It seems clear that if a body of data were built up on the relation of invention to social change, vastly significant information in regard to society's functionings would be deducible.

SOCIOMETRIC STATUS OF CHILDREN IN A NURSERY SCHOOL GROUP

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The Problem

There has been an important gap in sociometric studies to date--the evaluation of the social status of children in a nursery school. The nursery school can well be called the first step towards the forming of a society by children of about the same age. Obviously, if we could determine the initial inter-personal patterns at the earliest period when the child enters a group of its own, it may lead to the recognition of persistent configurations. In other words, it may lead to the recognition of the child's "sociometric status" at this period of its social growth. Sociometric status in this study means the position of a child in a group formed by children of about the same age level. The status is determined by the number of contacts which he initiates or which are initiated by the others towards him, and the acceptance or rejection pattern resulting from these contacts. If such information could be gained, it would be invaluable to nursery school teachers as well as to research experts. So often one hears a nursery school teacher saying that when Peter or John are absent, Ronald is "such a different child." Ronald may show various forms of behavior in these absences--more aggression, more constructive behavior, or isolation. In order to have a better understanding and to get at the root of these emotional problems of sympathy, aggression and submission, etc., we ought to know first of all the basic structure of a group which binds and separates children. Obviously, if we could show that these attraction and repulsion patterns take a <u>persistent</u> form, then the sociometric status of the child would have a diagnostic value and could become a significant factor in a guidance program. If we could show how one inter-personal structure influences every other individual in the group, then hostility can be traced to its source.

The setting for this study is a nursery school newly developed. The majority of the children are experiencing group life for the first time, and therefore establish their sociometric status for the first time. They have been allowed one month of getting acquainted with the setting and the equipment, so that the novelty of this should be reduced as much as possible to influence their inter-personal relations. The second month the study was begun. There is no significant difference in their economic status. The ages range from 2 years 6 months to 5 years. Although the I. Q. has not been measured, it is observable that no one is below average in intelligence.

Procedure

Observation of Spontaneous Activities. Observation of the twelve children's contacts with each other were recorded over a period of 4 weeks, for a total of 35 hours. An "experiment of nature" presented itself when the crucial member of a triangle was absent for a week. The effect which the broken triangle had on the total structure was studied. In a few individual cases, the time spent with each child was also recorded.

Verbal Choices. The children were allowed to make verbal choices as to whom they would like to go inside with to paint or draw. This was done for over a period of three weeks, three days a week, making a total of nine tests. The results were compared with the pairs formed in the course of spontaneous play activity.

Experimental Procedures. It is obvious that the sociometric test has to be modified when applied to pre-school situations. One of the factors greatly limiting sociometric procedures is the inability of the nursery child to express choice, attraction and repulsion, by verbal means. The first choice is in a majority of cases still made by children at this age level, but when it comes to less immediate preference levels which are usually expressed in second or third choices, etc., the child between 2 and 4 and even later is either unable to understand the question or to give any account for its feelings on the score. It is apparently due to the fact that at this age level only the immediate first choice matters and is acutely felt. The considering of several preference levels is a reflective effort for which they are not ready. However, as we know, in order to establish a sociometric status of an individual, the total complex of preferences of varying intensity

is significant. The first choice is not always available to an individual; therefore, the given and received, second, third and other choices indicate the resources upon which an individual can fall back in social emergencies. If, for instance, an individual is found attractive to ten other individuals although none of them may be her first choice, it suggests a wealth of inter-personal opportunities available. It is assumed also that these finer levels of preference exist also in nursery groups, but in order to reach them or to discover them, tests based on action rather than on words have to be worked out.

We can study, by simple observation, with whom a child has the largest number of contacts, conflicts, etc., on the one hand, and on the other hand, the least number, etc. The time technique has shown the intensity of relationships, and shows possibility of serving as one technique in the observational method of determining second and third preference levels more accurately than the mere ranking of the sum total of contacts with various children. However, still more precise is the experimental method--that of removing the one child, seemingly chosen the most by another, from the group and placing him indoors to paint or build blocks, and to study carefully and systematically the child left on the playground.

In the observational method, so long as we have the child of the original bond remaining on the playground, he still serves as a stimulus for his mate even though he has left him for another child, and the one left is free to make another choice. In the experimental method, we clear the field entirely by removing the child, leaving his mate to make a decision either between isolation or the choice of another child. It may happen that he doesn't have a chance to make a choice, because a child may come to him immediately and try to play with him. He may either reject him or may actually join him. We cannot regard this as a second choice in a strict sense, but we must also include this as an important part of the total picture. By continuing the experiment, whether he is chosen first, or he moves toward an object where another child might happen to be, and we don't know whether he is interested in child, object or both, by and large it is felt that he will initiate choices which will be persistent, if the experiment is carried out a sufficient number of times.

So far, it has been found that Edward, separated experimentally from Robert, at first goes off by himself, has a sad expression on his face, asks frequently when his mother is coming, and finally goes on with his own play activity isolated. The next time he is isolated only for a short time and

finally joins Jack. Jack reciprocates and he plays for the time that Robert is indoors with him exclusively. After the continuance of tests which remove Robert from the scene and we see a persistence of choice for Jack, we can assume that Jack is very likely his second choice. Then the next test removes Robert and Jack from the group placing Edward in the position of isolation or the immediate choice of another child. He joins Louise immediately, only to be rejected by Ruth already playing with Louise. By repeated efforts toward Louise, however, she joins him finally for a short time. It is interesting to note that in matrix 1, we find Edward's most initiated contacts, next to Robert, to be directed towards Louise and Jack. However, in the case of Ruth, when Louise was separated from her in a similar experimental test, she was likewise isolated for some time before choosing Mildred, a genuinely isolated and fearful child. In matrix 1, it may appear that Mildred plays a small part in Ruth's relationships, by virtue of the one choice and indifferent response of Mildred. However, Ruth's repeated attempts to get her to play are of long duration, unrevealed in the numerical results of the matrix.

Now that the basic structure of relationships has been determined, the study will continue in the future to explore further the experimental procedure just discussed. The two examples cited must be applied to many more children before any final results can be given as to the second and third preference levels.

Material and Analysis

The group consists of twelve children, five boys and seven girls. Six of them are four-year-olds; four are three-year-olds; one is five and the other is two.

The analysis of the material gathered is presented by means of the interrelation matrix, the sociogram, and statistical tables.

Analysis of Matrix 1

1. It is apparent here that Edward has an outstanding number of contacts for Robert.

2. Though not in so concentrated a form, it is also evident that Ruth has an outstanding number of initiated contacts with Louise. Louise reciprocates most of these approaches, but the number of contacts which she initiates with Sarah almost approaches the number she has with Ruth.

INTERRELATION MATRIX 1

Showing Attractions and Repulsions to and from Each Child

	Jack	Edward	Ruth	Louise	Robert	Frank	Sarah	Susie	Hannah	Florence	Daniel	Mildred
Jack	12**0**	9+ (6+)(20)(1-)	4+ (2+)(1-)(10)	4+ (3+)(10)	9+ (6+)(20)(1-)	(2+) (1+)(10)	(13+)(1-) (13+)(1-)	(14+)(1-) (14+)(1-)		2+ (1+)(10)	2+ (1+)(10)	
Edward	(5+)(1-) (5+)(1-)	15**0**	4+ (1+)(20)(1-)	5+ (1+)(40)	60+ (52+)(70)(1-)	(2+) (2+)		(1+)(1-) (1+)(1-)	- -	(2+)(1-) (1+)(10)(1-)	+ +	
Ruth			14**0**	16+ (11+)(30)(2-)	(2+) (2+)	+ 0		- 0		+ +		+ 0
Louise	3+ 3+	+ -	(11+)(1-) (8+)(2-)(20)	7**0**	+ +	+ -	10+ (7+)(30)	(2+)(1-) (2+)(10)	+ 0	6+ (5+)(10)	4+ 4+	
Robert	(11+)(1-) (8+)(30)(1-)	(13+)(1-)(10) (14+)(10)	7+ (2+)(4-)(10)	(6+)(1-) (60)(1+)	3**0**	(10+)(1-) (9+)(20)	(7+)(4-) (3+)(40)(4-)	(4+)(2-) (2+)(30)(1-)	(3+)(1-) (30)(1-)	+- 0-	4+ (2+)(20)	
Frank		2+ (1+)(10)	+ -	+ -	(2+)(1-) (1+)(20)	150		+ +	- -	3+ 3+		
Sarah	17+ (15+)(20)	6+ (20)(4-)	5+ (30)(2-)	(6+)(1-) (3-)(40)	4+ (2+)(2-)		17**0**	14+ (12+)(30)			2+ (1+)(10)	
Susie	14+ (13+)(10)	2+ (1+)(1-)	5+ (3+)(2-)		+ +	+ +	(6+)(2-) (9+)(10)	7**0**			2- (1-)(10)	
Florence	2+ (10)(1+)	5+ (1+)(10)(3-)	6+ (3+)(20)(1-)	5+ (2+)(20)(1-)	4+ (10)(3-)	6+ (3+)(30)	+ 0	(1-)(1+) 2-	(6+)(3-) (6+)(3-)	5**0**	2- 2-	(1+)(1-) (10)(1-)
Hannah		+ 0	3+ (10)(2-)	6+ (30)(3-)		(2+)(1-) (1+)(2-)			15**0**	(7+)(2-) (6+)(10)(2-)	(2-)(3+) (2-)(20)(1+)	(2-) (2-)
Daniel			+ +	4+ 4+			+ 0				20**0**	- -
Mildred												50**0**
Total	(52+)(2-)	(35+)(1-)	(47+)(1-)	(53+)(2-)	(84+)(1-)	(25+)(2-)	(40+)(7-)	(37+)(7-)	(10+)(6-)	(22+)(4-)	(16+)(5-)	(2+)(4-)

Key: + = Positive Contact
- = Negative Contact or Rejection
0 = Indifference
0 = Isolation

Time: 27 hours over a period of three weeks.

Example:

The upper row is the approach of each child in the vertical column to each child in the horizontal row, and the second row is the response of each child in the horizontal row to each child in the vertical column, i.e.,

	Ruth
Jack	4(+) (2)(+)(1-)(10)

means that of the four times that Jack approaches Ruth positively, twice Ruth reciprocates positively, one of the times she rejects or is aggressive to Jack's positive approach, and the other time she is indifferent.

Ruth, however, draws continuously upon the social expansiveness of Louise, and when not able to succeed in having her for herself, falls many times into isolation. Even though she is approached by other children, she quite often responds with indifference or rejection, and waits for the time when she can have Louise again.

3. This same situation is true of Edward and Robert to a far greater degree. Edward is continuously drawing upon the social expansiveness of Robert, who is certainly greatly frustrated in his contacts with other children due to this. He does respond to Edward's desire to play with him for the most part, but initiates far less contacts toward Edward than Edward does toward him.

4. We notice further a strong bond between Jack, Sarah and Susie who are frequently together as a "triangle" alternately two together and the third isolated. Outside of her "triangle" Sarah is rejected when trying to "break in" to other groups, so that eventually if both of her mates are tied up with some one else, she falls into isolation. Jack is more successful in his contacts with other children than Sarah.

5. Florence and Hannah, by virtue of their many contacts with each other, appear to form a positive bond. Here again, the situation is a bit one-sided. Florence has a number of contacts with other children almost equal to those with Hannah, while Hannah has a predominance of positive relationships with Florence only. Many of her approaches to other children are responded to indifferently or she is rejected.

6. Daniel, the youngest member in the group, follows his older sister, Louise, and his contacts are doubtless influenced by her position in the group.

7. Mildred presents an abnormal picture, since her adjustment to nursery school life as a whole has been difficult. She is, however, chosen by other children, but out of fear for them, rejects them.

8. It is evident also that Edward rejects some of the companions of his mate, Robert, when both Edward and Robert are approached by them. Robert has assumed a protective attitude toward Frank and quite frequently takes him into his play activity. Edward does not reject him. Frank is a very timid, unaggressive child who looks for an emotional tie. Edward, though not timid and shy, is likewise dependent emotionally upon Robert.

INTERRELATION MATRIX 2

Showing Attractions and Repulsions to and from Each Child in the Absence of One Crucial Member of a Strong Bond

	Ruth	Louise	Frank	Robert	Edward	Susie	Jack	Hannah	Florence	Mildred	Daniel
Ruth	30	5+ (2+)(20)(1-)	- 0	(3+)(2-) (3+)(2-)	2- 2-		(4+)(1-) (4+)(1-)		(1-)(2+) (1+)(1-)(10)	4+ (3+)(10)	
Louise	(4-)(2+) (4-)(1+)(10)	10		3+ (10)(1-)(1+)	+ 0	2+ (10)(1+)	+ +	5+ (4+)(10)	7+ (6+)(10)	- -	3+ 3+
Frank			50		+ -		+ +		+ +	+ 0	
Robert	(5+) (20)	3+ (10)(1+)(1-)	2+ 2+	20	2+ 2+		3+ 30	3+ (2+)(10)	+ -		+ +
Edward	+- 0-	2+ (10)(1-)		11+ (40)(1-)	80		3+ 3+	+ -	+ 0		
Susie		2+ (1-)(1+)	+ 0			80		2+ 2+	+- 0-		
Jack	9+ (2+)(4-)(30)	2- 2-	2+ (1-)(10)	6+ (3+)(1-)(20)	3+ (1+)(2-)		60	1- 1-	2+ (1+)(10)	+ +	
Hannah			+ +	+ -		- -	+ +	60 (4+)(1-)	(4+)(2-) (3+)(2-)(10)	2- 2-	
Florence		3+ 30	3+ 3+	- -		- -		(4+)(1-) (4+)(10)	20	+ +	
Daniel		+ 0									
Mildred	+ +									200	

Time: 8 hrs. over a period of a week.

Analysis of Matrix 2

1. We see quite a different picture here as compared with matrix 1. In response to Sarah's absence, one of the members of the broken triangle, Susie, has very few contacts and falls practically into isolation, while the other member, Jack, forms new contacts.

2. Along with this, we notice obvious negative contacts between Ruth and Louise, once forming a strong bond, negative contacts only between Louise and Jack, newly attached to Ruth.

3. The time sequence is not evident here, but in the original recordings, it is found that Edward rejects the approaches of Jack, who successfully wins Robert. He finally sees that the aggressive approach is not bringing him to Robert. He therefore approaches Jack in a more positive manner in order to work his way into Robert's and Jack's relationship.

4. As always, Edward still centers the predominance of his contacts upon Robert, whereas Robert initiates very few toward Edward--at times, he is indifferent to Edward's approaches.

5. Of the few contacts Susie has, she successfully plays with Hannah. We find Susie and Florence in negative contacts, and eventually Florence and Hannah. Usually these conflicts arise at the breaking in of Susie (the most isolated member due to the broken triangle) upon Florence and Hannah playing.

6. It is necessary to know the causes leading up to the positive and negative approaches which are not evident in the total calculation. By this is meant the necessity of knowing that Ruth's frequent rejections of Jack are due to Jack's attempt to join Louise in her play activity with Ruth. When Ruth may respond to him positively, it is at a time when she is not absorbed with Louise.

7. We also find that due to Robert's frequent playing with Ruth, that conflict arises between Ruth and Edward when Edward tries to come into their play activity. Ruth at first ignores him. This results in Edward's initiated negative approach to Ruth. The only other child, other than Robert, whom Edward has any successful relationship with, is Jack. He resorts to Jack when deserted by Robert, or remains alone, with a sad, forlorn expression on his face.

8. In sum, we find the breaking up of Jack, Sarah, and Susie affecting practically every member of the group. For Jack and Ruth, it is rather favorable, but for Susie and Edward

it leads to isolation or rejection. The group, as a whole, in trying to make a new adjustment to this upheaval, experiences some hostility and aggression.

Table 1

Showing the Percentage of Positive Relationships for Each Child, the Percentage Concentrated Upon One Child, and the Percentage Remaining for the Group

	Total number of children contacted	Total number of contacts	Total number of positive relationships	% of positive relationships	% of concentration upon one child	% remaining for group
Jack	9	114	92	80%	60%	40%
Edward	10	125	86	68	77	23
Ruth	10	70	34	48	55	45
Louise	10	97	52	53	31	69
Robert	10	159	106	66	62	38
Frank	8	45	23	51	43	57
Sarah	7	102	62	61	79	21
Susie	9	78	60	76	80	20
Florence	11	70	33	47	36	64
Hannah	8	45	14	31	86	14
Daniel	9	57	14	48	57	43
Mildred	4	0	0	0	0	0

Analysis of Table 1

1. It is interesting to note here that Florence, who has the highest number of contacts, has next to the lowest percentage of positive relationships and next to the lowest percentage of concentration of contacts upon one child. It is safe to assume that so much of her social expansiveness being spent over a wider area cannot have much left for concentration upon one child. Note Hannah's lower contact range and her high percentage of concentration upon one child.

2. Though Edward has a high contact range and a high percentage of positive relationships, he has 23% of these distributed over nine children and 77% concentrated upon Robert.

3. To a less degree, this is true also of Jack who concentrates 60% of his positive relationships upon Susie and Sarah and has 40% left for seven children.

4. It is noticeable that there is not a very great difference in the contact ranges of the children, and its significance is not so great unless we know whether these contacts are of a positive or negative character, or see them in relationship to the distribution of social expansiveness.

5. This numerical summary bears out further the facts revealed in matrix 1 that Sarah's positive relationships to the group as a whole are of a small percentage.

6. We see, further, that the gap between the contact ranges alone are not informative enough unless we know how many contacts are spread over these ranges. For example, Frank has a contact range of 8, one less than Jack, but he has merely 45 total contacts to Jack's 114.

Table 2

Showing the Percentage of Positive Relationships for Each Child, the Percentage Concentrated Upon One Child, and the Percentage Remaining for the Group in An Experimental Situation

	Total number of children contacted	Total number of contacts	Total number of positive relationships	% of positive relationships	% of concentration upon one child	% remaining for group
Jack	8	39	18	46%	33%	67%
Edward	7	29	12	41	50	50
Ruth	8	55	20	36	16	84
Louise	8	47	20	43	30	70
Robert	7	46	23	50	34	66
Frank	7	14	8	56	50	50
Daniel	2	4	3	75	100	--
Susie	4	11	4	36	50	50
Florence	9	38	19	50	46	54
Hannah	9	32	18	56	38	62
Mildred	6	11	6	54	50	50

Analysis of Table 2

1. We see here the upheaval in the structure of the group due to the breaking up of the triangle, due to Sarah's absence, that we see in matrix 2.

2. Edward, who formerly had a percentage of concentration of positive relationships for one child far above what he had for the group, has 50% for each in this new arrangement.

3. Ruth's concentration upon Louise has greatly decreased and a far greater percentage is distributed mostly between Jack and Robert and the rest of the group. Louise likewise has very little for Ruth and has a greater percentage elsewhere.

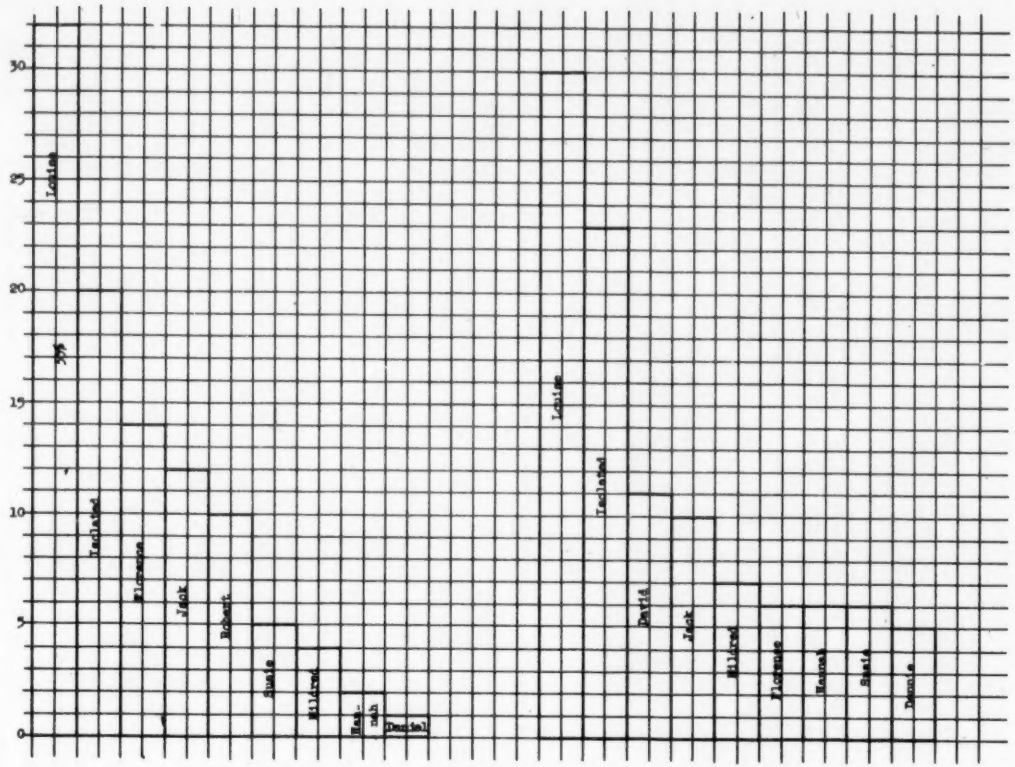
4. Hannah's concentration of social expansiveness has decreased considerably, her pattern with Florence being upset due to the shifting of relationships.

Analysis of Graph 1

Here is seen the importance of measuring the duration of relationships. If one were to consider the number of relationships alone, one would find Florence next to Louise in Ruth's stream of relationships. We find that Ruth may have many contacts with Florence, but the few that she has with Robert have been of longer duration. The relationship with Robert is, therefore, more intense and significant. When we are to study second and third choices by observational methods, it will be important to include the time factor in order to determine with accuracy the second and third choices.

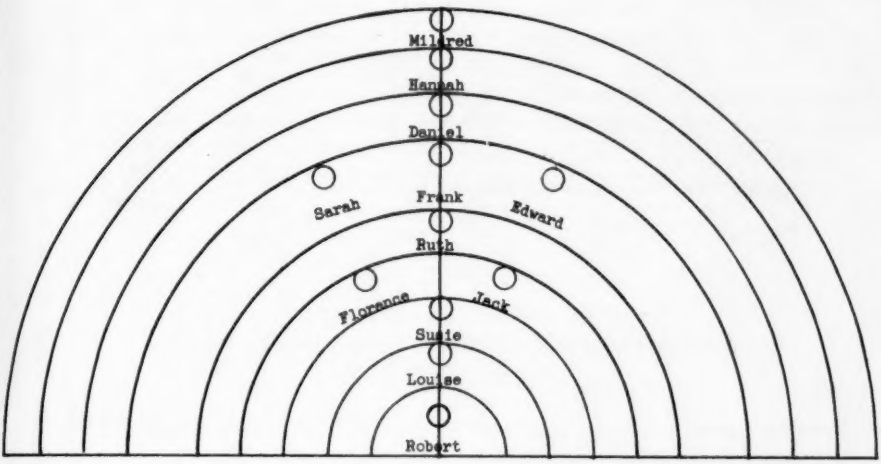
Analysis of Sociogram 1

On the basis of the quotient of attraction, we see here the placement of each child on a radial line from the center of half-concentric circles. Robert, at the center of the half-circle, has the most choices, and is the least times isolated, whereas Mildred, in the outermost concentric circle has the least number of choices, and is the greatest number of times isolated. On the whole, we find here the "dependents," those initiating the greater portion of their contacts with one child, radiating towards the outer part of the circle, and the recipients of these concentrated choices nearing the center of the circle.



Graph 1

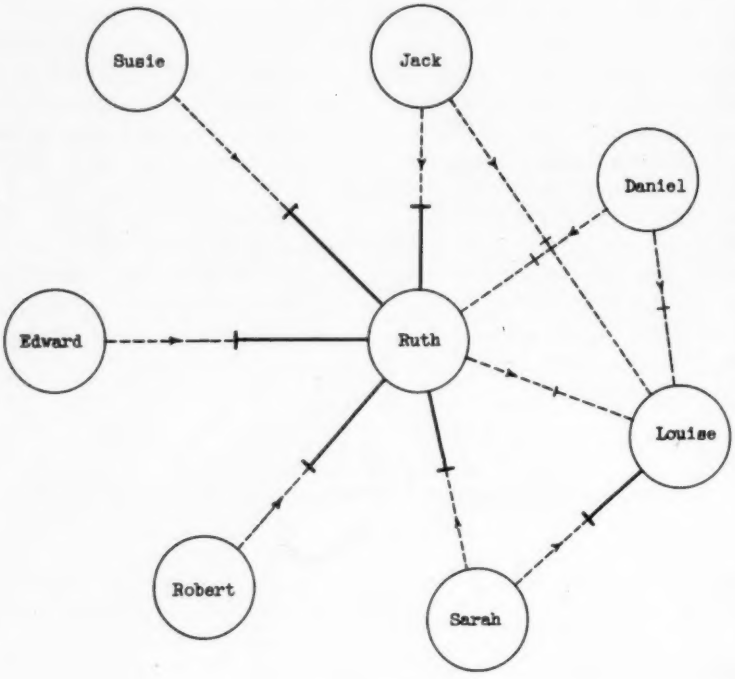
Showing the Comparison of Ruth's Percentage of Positive Relationships with Each Child with the Percentage of Time Spent with Each Child



Sociogram 1

Showing the Ratio of Total Number of Choices to the Number of Times Isolated in Order to Derive Quotient of Attraction

	Ratio	Quotient of Attraction
Robert	84:3	28
Louise	53:7	7
Susie	37:7	5
Florence	22:5	4
Jack	52:12	4
Ruth	47:14	3
Sarah	40:17	2
Frank	25:15	2
Edward	35:15	2
Daniel	16:20	.8
Hannah	10:15	.7
Mildred	2:50	.04



Sociogram 2

Key:
---→--- = Initiated Attraction
——— = Rejection
---+--- = Mutual Attraction

Analysis of Sociogram 2

This shows the position of Ruth in relation to her contacts with other children as typical of one situation to explain her position in the concentric circles. Referring back to matrix 1, we find Ruth quite a number of times isolated but having a high total of choices. The sociogram illustrates how this has come about by one striking illustration of a few hours of observation.

Ruth is attracted to Louise and successfully gets her into play activity. Jack, Susie, Edward, and Robert approach Louise and Ruth to join them in play, at different intervals. Ruth rejects them immediately. They still stay around in their play area, which is very often an imaginary house, until eventually Louise accepts them by going away with them.

Ruth prefers to be alone rather than to join the new "twosome," until she can successfully get Louise back. Again, other children try to join them with the same procedures taking place. Daniel, however, the two-year old brother of Louise is accepted by Ruth, and Sarah is mutually rejected by Louise and Ruth. It is, for this reason, that we find Ruth having choices which she refuses to make use of, because of her apparent attraction for or dependence upon Louise. If it were merely a question of her unwillingness to admit a third party regardless of whom she is playing with, she could make use of some of her incoming choices and form a "twosome." But at all times she falls into isolation rather than to resort to this.

Table 3

Comparison of Verbal Choices with the Spontaneous Relationships Developing out of Group Play

Choices of each child	No. of choices out of 9 tests	Pairs discovered in spontaneous activity
Edward Chooses Robert	9	Edward and Robert 4 yrs. 4 yrs.
Ruth Chooses Louise	5	Ruth and Louise 5 yrs. 4 yrs.
" Robert	1	
" Mildred	2	
" Jack	1	
Louise Chooses Florence	4	
" Ruth	3	
" Sarah	1	
" Jack	1	
Sarah Chooses Susie	2	Jack, Sarah and Susie
" Jack	5	4 yrs. 4 yrs. 3 yrs
" Louise	1	
" Daniel	1	
Susie Chooses Jack	3	
" Sarah	4	
" Ruth	1	
" Hannah	1	

Table 3 (cont'd.)

Choices of each child	No. of choices out of 9 tests	Pairs discovered in spontaneous activity
Jack Chooses Hannah	4	
" Sarah	2	
" Robert	1	
" Edward	1	
" Ruth	1	
Florence Chooses Ruth	2	Florence and Hannah
" Robert	2	3 yrs. 3 yrs.
" Jack	1	
" Frank	1	
" Hannah	1	
" Sally	1	
" Sarah	1	
Hannah Chooses Florence	2	
" Daniel	3	
" Louise	1	
" Jack	1	
" Susie	1	
" Robert	1	

Daniel expresses no desire

Frank expresses no desire

Mildred wants no one

Analysis of Table 3

1. The strongest bond in the group stays consistently so in the verbal choices, that of Edward for Robert. Robert has his greatest number of verbal choices for Edward.

2. As in the spontaneous play activity, Ruth has more choices for Louise than the latter has for her. Louise is one of those who seems less definite as to whom she would like to draw with, her choices seeming random as do the younger children, Florence, Hannah, and Susie.

3. Jack, though older than these three, is also rather indefinite as to whom he wants and the choices seem random and inconsistent with the choices in his play activity.

4. The most that can be concluded from these results appears to be that the children having the greatest number of

initiated contacts with one child, make the greatest number of choices for this same child in the verbal tests. These children happen to be older. The younger children, having concomitantly less concentrated relationships, are rather inconsistent in their verbal choices in comparison with their choices in spontaneous play activity.

Conclusions

1. Children of pre-school age develop a significant social status in groups of their own making, as, for instance, nursery school groups. It differs from the usual concept of social status determined by prestige—rating, I.Q., income, educational background and other factors in that it is primarily based on the earliest inter-personal relations as they emerge in spontaneous groupings. This new concept of social status is called sociometric status.

2. There are persistent patterns of attractions and repulsions characteristic for a child at different points in time. There are children of high and children of low sociometric status.

3. Children develop varying degrees of intensity of relationship for one another. The degrees of preferences are not visible or at least not demonstrable by observational methods only. By means of experimental devices which exclude certain children from the group, these various levels of preferences come to the fore.

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This paper is the first step in a follow-up study. After a 6-month's period a new report will be made. Especial emphasis will be placed upon the relationship of verbal response to action-response.

BOOK REVIEWS

DIMENSIONS OF SOCIETY - A QUANTITATIVE SYSTEMATICS FOR THE SOCIAL SCIENCES

Stuart Carter Dodd

The intellectual history of civilization is full of new systems of classification. Dodd's S-formula is the latest of these. It consists of the theory that everything, whether qualitative or quantitative in expression, may be described by an appropriate variation of the formula,

$$S = {}_{s}^{s}(T ; I ; L ; P)_{s}^{s}$$

There are four sectors of experience, T = time, L = space, P = population, and most significant of all, for both logical and sociological reasons, I = indicia, indicators of some trait, or more precisely, indicators or measures of everything else. Thus by definition the formula can be used to describe all things; it fits everything by definition.

Of what utility is such a generalized scheme of classification? When we name something we are classifying, since things having different names are regarded as in some respects unlike. An individual object has no name and belongs to no class until we place it in one. The purpose of classification and the interests we have determine the names we use. There is no necessary connection between a term or a class-name and its referent. The connection is arbitrarily established by usage or by definition for the purposes we may have at the time. Thus sociological usage defines a "primary group" as, "a family," "a neighborhood group" or "a play group of children." Here the referents of the name or term "primary group" are a series of other terms, class-names, or designata. This process of naming has been given reality and concreteness by the research studies of Kolb, Terpenning, Dorothy Thomas and Angell, because these studies supply the denotata. Does Dodd's system of algebraic class-names supply any denotata, or does it merely furnish new designata expressed in algebraic form?

Take a study by Moreno[1] of the structure of interrelations between two racial groups, 23 colored girls and 34

[1]Moreno, J. L., Who Shall Survive? p. 214.

white girls, living in proximity. Dodd's descriptive formula applied to this study yields the expression, $S = {}^{p}p :: {}^{q}p : {}^{j}I$, where S is the social situation, ^{p}p stands for the 34 white girls, the symbol :: stands for "interrelated with," ^{q}p represents the 23 colored girls, and ^{j}I stands for attitudes in three degrees of attraction, indifference and repulsion.[2] The quantic number of this situation is : 0 ; 1 ; 0 ; 2, since the sector T = time is not involved, nor the sector L = space. The situation of a friendship constellation in a New England village, described by Lundberg,[3] Dodd symbolizes thus: $S = {}^{p}p :: {}^{p}p : I$. The quantic number for this situation is the same : 0 ; 1 ; 0 ; 2. Says Dodd, "The quantic number is the heart of the S-theory. It serves to classify every S that can exist into a single, definite, unambiguous category according to its combination of indices and exponents. The quantic number thus provides a thoroughgoing basis of classification for all quantifiable societal phenomena...."[5] It would seem that application of the S-theory to these two studies of social situations, giving them both the same quantic number, tends to obscure rather than to illuminate the differences between the two situations, to obfuscate the very thing that science seems to describe in a differential manner.

It seems that the S-formula merely stands for words or numerical symbols and does not add any new information. In other words, the S-formula supplies a new type of designata and does not add new denotata. Science seems more likely to advance by systems of analysis which sharpen our powers of description rather than by the addition of algebraic formula to describe or stand for facts already gathered (in this case by Moreno, Lundberg and Lawsing) and already described in words or by numerical symbols. Thus Dodd's system interposes between the terms of sociological usage and the things these terms stand for, a new scheme of algebraic symbols, ingeniously arranged to be internally consistent in logical relationship, but not adding any new information about these things.

It may be asked however, does not Dodd's scheme supply illuminating summarization for relationships hitherto

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[2]Dodd, S. C., Dimensions of Society, pp. 418-419.

[3]Lundberg, G. A., and Lawsing, Margaret, "Sociography of some Community Relations," Amer. Sociol. Rev., 2:326-327, June, 1937, p. 329.

[4]Dodd, op. cit., pp. 422-423.

[5]Ibid., p. 41.

verbally described? This is a question that can be answered by use of a simple example of curve-fitting to data of observation. Take Ogburn's study[6] of the relationship between sex-ratio in 170 cities and the percentage of women 25 years of age and over who are married. Tabulated data show clearly that cities which have larger proportions of men also have larger proportions of women married. The coefficient of correlation is high, $r = +.81$. The equation of the line of regression fitted to these data is, $X_f = 37.5 + 0.29\ X_i$, where X_f represents the percentage of married women, and X_i represents the sex-ratio (males to 100 females). In this problem, the equation of a straight line, $Y = a + b\ X$, was fitted to the scatter of observations of these 170 cities, and the parameters, $a = 37.5$ and $b = 0.29$, were found by the conventional mathematical methods. The resulting equation summarizes the relationship of the two variables. But note that in this problem, the data of observation were substituted in a generalized algebraic equation of most probable best fit by the method of least squares. Thus there was derived an empirical equation which can be used for predictive purposes and is susceptible of verification; that is, given the data, any competent person familiar with the method, would get exactly this equation with exactly these constants, and no others! In the process of computation the data influenced the determination of the size of the parameters, thus allowing variety in symbolic substitution corresponding to the variations among the cities described. In comparison to this procedure, Dodd's classificatory method seems to allow no such expression of unique data in a unique empirical equation, but rather seems to impose upon unique data a uniform generalized classification by arbitrarily-ordered algebraic symbols. Thus Dodd's method of summarization is the substitution of algebraic symbols, arbitrarily arranged, for the statements of original observations made in terms of words, charts or numerals, as the case may be. It adds nothing to the information previously existing in the original word descriptions. On the other hand, the empirical equation worked out by Ogburn enables us to predict within computed limits of probability, the percentage of women likely to be found married in any given city for which the sex-ratio is known, thus adding something to knowledge, something not revealed in the original data as such.

We seem to come unavoidably to the conclusion that

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[6] E. F. Groves and W. F. Ogburn, Amer. Marriage and Family Relationships, pp. 479 ff,

the S-theory will be valuable only to those sociologists who can make use of a shorthand algebraic class-name as a substitute for the more familiar verbal designations. In so far as this substitution is advantageous it will have to be established by sociological usage rather than by one scholar's assertion. Nevertheless, Dodd has constructed a new scientific language for the classifying process of the social sciences. The question arises, "Does this new language, with its highly generalized sign vehicles, stand for sense data in a manner that yields more precise description and illuminating explanation?" The question is worth asking since more precise description may yield explanation. As a matter of fact, this is merely another way of stating the criterion of communicability. Does Dodd's system of symbols facilitate communication between social scientists? Since his symbols merely abbreviate the conventional folk word symbols, whether these be those of verbal usage or numerical expression, it is not at all conclusive that he has improved the methods of communication. His symbols do not provide any more precise scales of measurement than now exist. His symbols provide a new level of designata, or class-names, and do not provide new denotata, or facts. Furthermore, his symbols do not seem to lead to helpful tautologies that unfold relationships implicit in the phenomenal record and previously unrecognized (as for example is done by Fisher's development of the analysis of variance).

The author has done a prodigious amount of work in assembling and classifying an enormous and highly varied mass of material. There are twelve chapters in six parts: part one, deals with the sectors of society, indicia (of traits), population, space, and time; the following parts elaborate in detail each of these sectors. There is a two page author's index and a 13 page topical index. There are four appendices consisting of a glossary, rules for writing the S-formula, research suggestions, and a bibliography of 83 titles. The system presented at the great length of 944 pages in attractive typography is original, closely knit and, like all his work, shows rare capacity for painstaking analysis and organization.

F. Stuart Chapin,
University of Minnesota.

ANNOUNCEMENTS

Dr. George A. Lundberg has been elected President of The American Sociological Association for the year 1943.

A new section, "Man Is The Measure," by Read Bain is introduced in this issue of Sociometry. It is to be hoped that the brilliant scholar and writer will bring to our readers in every issue challenging and stimulating ideas. During the past five years the readers of the American Sociological Review have been considerably regaled and relieved from the stern tone of the scholarly journals by the editorial comments on men and affairs by Read Bain. On his retirement from the editorship of the Review, we suggested to him that he should continue his columnist activities in Sociometry. This he has consented to do. Accordingly, we announce herewith a new feature, the nature of which is set forth by the contributor himself. From his opening remarks we conclude that Professor Bain intends to consider himself a calumnist rather than a columnist, but in any case we welcome his contribution and assure him of freedom from editorial restraint. Barring libel, blasphemy, profanity and sedition, we invite his sage observations on the scientific scene and on the cosmic joke in general. Our columnist has stated so well the reasons for this departure in scholarly journalism that further editorial introduction is unnecessary. Common probity, based on long familiarity with the new columnist's verbal antics and mordant wit dictates, however, that the editors disclaim any responsibility for the views expressed in this column. Also, we specifically reserve the right not to take notice of such of its remarks as are directed at us, without the implication that silence gives approval or admission that we are in any degree at a loss for adequate answer. With this understanding we welcome the premier columnist of scientific journalism.

The Sociometric Institute is giving free introductory lectures and demonstrations in Sociometry and Psychodrama once a week. These lectures are open to students of sociology, psychology and psychiatry. Applications should be addressed to the Institute.

REPORTS

THE MAIN ISSUE OF THE WAR

The following is a crucial part of the speech delivered by J. L. Moreno during the Sociometric Conference on National and Post-War Problems on June 27th at the Sociometric Institute.

"The main issue of this war has already been decided: there is no master-race on earth--no people superior to all other peoples. No matter which race or nation emerges from the war as victor or vanquished, and no matter how long the war endures, this fact will stand forth as its major lesson.

It has been clearly demonstrated that all major national groups are nearly equal in spontaneity, initiative, ingenuity and leadership when it comes to a moment of great crisis. The Germans started this war only after tremendous advance preparation in weapons of warfare and in the organization of war-morale. They obtained--and still have--the initial advantage, but if they were truly a "master-race"--a superior quality of race--as they claim they are, they would have been able to maintain and increase their advantage as the war went on. On the other hand, if the United Nations had not had nearly the same--or even greater--potential resources of spontaneity, initiative, ingenuity and leadership, they would never have been able to survive a dozen defeats and return to the struggle, each time more resourceful and better equipped.

The gravest error the Germans made was not their challenge of the democratic process of government with government by dictatorship. Their greatest mistake was their overestimation of their own mental and physical prowess. But the myth of their superiority has already been shattered--no matter what course the war may take or what its end may be. For them this is a tragedy, for many Germans truly believed in the idea of their own unparalleled greatness. Therefore, when awakening gradually penetrates the minds of the German people, the effect upon them of their disillusionment will be profound. More than all victories or defeats on the battlefields on all fronts, this fact will affect the outcome of the war. The shock will produce throughout the Reich an outbreak of depression and despair unequalled in German history.

There is nothing essentially absurd in a theory that one people might be superior to all other peoples, but it just happens that the Germans embarked upon the war with a false premise: that they are a superior race. Today we can say that the debate on the role of force in human affairs has found an answer. Force, as a method of changing the face of the world, cannot succeed unless it is used by a people which is in every respect genuinely superior to the rest. But such a people would not, in the first place, have to resort to force in order to control the world. It would be the master--in any case. The use of force thus becomes the indication of an essential weakness: it is the last resort of a people who cannot gain mastery by the effect of their sheer strength. Force alone cannot decide fundamental issues. Force, in the hands of a particular people, cannot get very far in an attempt to annihilate or exterminate all other peoples, because those attacked will respond with equal or superior force and will produce equal or superior means of waging war. The Germans may not have as yet lost the war, but they have already failed in their "spontaneity test." The blitz is over. From now on they must face opponents of growing readiness.

Physical force, as an arbiter of fundamental issues, must be abandoned forever. The idea that it is an arbiter is a dream: it doesn't work! A totally opposite scheme of approach must be brought to the attention of the leaders of the twenty-eight nations which stand behind the Atlantic Charter--sociometry, a scheme which bases its recommendations upon the deeper facts of inter-human relations.

The main issue of the post-war world will be to set up some plan which will prevent, by its very composition, the employment of force as a medium for setting international conflicts. The basis for any enterprise of this kind is sociometry, the science of the study of inter-human relations. Sociometry has enormous potentialities for development, and had it been applied to the social problems which precipitated this war, hostilities might never have started. More than twenty billion dollars have been spent in the last ten years alone to maintain the public schools of the United States. If but a small percentage of this sum had been allocated to the education of our children in the sociometric principles of thought and conduct, this war might never have begun--or, certainly, this country would have been prepared to present itself as an example to a post-war world and to teach the warring nations a better philosophy of life."

MAN IS THE MEASURE...

Read Bain
Miami University, Oxford, Ohio

Apologia. It was Moreno's idea, not mine. Moreno is an anamorphoscopic wight. Nothing pertaining to man is alien to him. He believes "there are more things in heaven and earth than are dreamt of in our philosophy"--and science. So do I. Hence, when he proposed that I should have some space in each issue of Sociometry in which to say just what I jolly well please, with no holds barred and no questions asked, it appealed to my cribbed, cabined, and confined spirit which has suffered for lo! these many years from cortical inhibition and academic convention--or possibly from ayenbite of inwyt. The idea was presented to the editor of Sociometry and his staff who approved with the clear understanding that the journal should never be held responsible for anything in "Man is the Measure": such matters as duels, libel, plagiarism, profanity, lèse-majesté, and other violations of the sacred taboos usually observed by scholars and gentlemen.

At this point, an ugly question rears its grisly head: How many readers of this estimable family journal will read "Man is the Measure" with any pleasure or profit? To how many lost scientific souls will such a "column" be amreeta, ambrosia, and manna? The very word "column" (which implies columnist) raises dark doubts. Can a scholarly journal have a "columnist" and still be regarded as scholarly? Can a Golden Path be found between the low comedy column which most newspapers affect for the benefit of their less literate readers, the Winchellian type of chitter-chat which perhaps has its academic counterpart in the News and Notes of the chaste A.J.S. and the Current Items of the staid A.S.R., and the ambiguous drivel of the self-appointed "military experts," news analysts and political pundits, to say nothing of health and love advisers--those serious people who know all, tell all, and are to the intelligent reader what the pedant is to the able student? Can anyone survey and follow such a straight and narrow path?

The only way to find out is to try it. (Good slogan for social scientists.) The idea may be sound even if the patient (reader) dies because Bain is too banal--or doesn't

have enough on the ball to make the game interesting. The only way to ascertain this is to have "Man is the Measure" in three or four issues and then see whether the continued usefulness of Sociometry seems to be imperiled. Opinions on this question can be mailed either to the Boss of "Man is the Measure" or to the Editor. If a few are pleased, stimulated, or mildly edified and not too many cancel their subscriptions, the Boss will gladly continue his labor of love.

The tone will be high but somewhat critical. I hold that comments on other people's work (e.g., in book reviews) should be largely negative criticism. That many commendatory remarks which might be made about the serious work of any competent scholar should be taken for granted. The scientist should always welcome having his attention called to possible shortcomings in both his methods and conclusions: the true scientist is a lover of the "negative case." Although Sociometry is "A Journal of Inter-Personal Relations," nothing said in "Man is the Measure" should ever be taken "personally." Sometimes the remarks may be sharp because I hold there is too much mealy-mouthed back-scratching and dust-jacket blurbing in scholarly journals, especially in the book review departments. That should be left to the literary lads who invented the racket to please the boys who publish books for profit. I seriously doubt whether a scholarly journal should ever review a book which has been furnished free by the publisher. It should review only books which some scholar, competent in the field with which the book deals, has read and feels moved to comment upon. At any rate, no one should take anything personally. If I want to lambaste Lundberg or macerate Moreno, they must take it and like it because that is part of the bargain. If I criticise what I think are their egregious errors, it is not because I love them less but because I love truth-as-I-see-it more. I have seen "beautiful friendships" destroyed because some so-called scientist has identified his ego with his theories to such an extent that he hates anyone who does not accept his ideas in toto. I have had such unlovely experiences myself. This is one of the sharpest thorns in that bed of roses which is the intellectual life. On the other hand, some of my best friends are people with whose views I often disagree with violence and vehemence; we disagree strongly but agreeably, often to our mutual intellectual benefit. This, it seems to me, is how it should be in the House of Science, in the Tabernacle of the Lord, and in the labyrinthine Halls of Art.

The tone will be light but serious. The most Amiable

and Estimable Lady I know, who is also my Severest Critic, asserts that my attempts at humor are usually both inelegant and elephantine. This may be an occupational disease of professors. If so, then there is an outside chance that the elephantine touch may be appreciated by the readers of Sociometry. There is no doubt that Sociometry is a serious scholarly journal (vid. pp. supra), but there may be a place even in such a journal for comment that is not mere chit-chat about the promotions and movements of the bretheren, announcements of meetings, and dope on places where easy money can be obtained for needed (?) research, "Man is the Measure" will be a place where the mind runs free, where contributors may have their "say" (briefly, and at the discretion of the Boss), where spontaneity (within limits) may burgeon unashamed and unafraid (This is Moreno's idea, not mine).

It is my idea, however, that many professors (and their students) would profit greatly from a little spontaneous use of the "lighter touch" even though it be slightly elephantine. With practice, it might become gazelline. Man and boy, I have been on and in front of the professorial chair for thirty years. I am sure that much of what passes for professorial profundity, when stripped of its verbal cloak of one drab color, is merely pompous platitude. The good professor, like that Great Guy, Joseph, hath a cloak of many colors, and of these, the stripes of genial wit and humor, including the ability to laugh at one's self, are of the brightest hue and most alluring texture. The only colors most of us possess are those that bedeck our medieval badge of servitude cap, hood, and gown: the symbol of our bondage to the book, the educational ritual, and the cloistered college hall. When shall we Burn the Robes, make the book a tool instead of a staff for feeble minds to lean upon, come out of the cloister into the living Here and Now, vibrant with all the richness and fullness and tragedy of life which enfolds all the sons and daughters of all the earth? "Man is the measure--and the Measurer--of all things."

The Professor should be first of all a man; then, a man of wisdom; then, a man of knowledge and skill. If there is any balm in Gilead, it may annoint our swollen egos if we take ourselves somewhat less seriously; if we prove by our example that true knowledge and wisdom are always simple, thrilling, and beautiful. If we can make learning creative, it will be adventuresome, pleasant, and satisfying. Perhaps it may even be able to compete successfully with football and business. These activities are deadly serious but I notice that footballers laugh and joke and "horse around"; so do business

men at Service Club Luncheons and otherwhere. Few psychopaths have any sense of humor and fewer still can laugh at themselves. Many teachers cannot laugh at anything and least of all at themselves who frequently are royal subjects for laughter. If they essay humor at all, it is usually the musty chestnut, or the cutting remark to the defenseless student, or sarcasm, or ridicule. Even the low comedy of the athlete's practical joke is better than this, or better than no humor at all. The professor merits praise when he attempts the lighter touch even though the result is something like the elephants doing the "Dance of the Leaves." If the professor succeeds in this high endeavor, his name shall be blessed even unto the third and fourth generation of students. If he can smile at himself and his colleagues, he is on the road to success and may escape the double damnation and seventh special hell reserved for the egocentric pedant.

This is the informal, unrehearsed way we are going to run this program. If anyone can get an idea out from it which he can use, it is his for the taking. If anyone wants to take issue with what is said here, let him shoot, briefly and to the point, and unless he requests that it be not printed, the pertinent and pungent paragraphs may be used. Any suggestions for topics to be discussed by the Boss of "Man is the Measure" will be gratefully received and seriously considered.

Needless to say, this thankless task which some Imp of the Perverse induced me to undertake will result inevitably in considerable loose talk, dogmatic statement, dubious speculation, and doubtful conclusion. To do it well, one must be a "neck-sticker-outer," but since I have no reputation to lose and no ambitious goals to gain, I am free to do and say what I damn well please--except for the fact that I really am a gentleman at heart. Space is too limited to permit any thorough or systematic work, even if the flesh were willing and the mind were able. "Man is the Measure" is rather an academic romping ground, a busman's holiday for the free play of the mind. If any light is given, it will be transient sparks struck off by a mind running free--but not hog-wild, I hope. It should be noted, however, that the wildness of one generation is the tamest commonplace of the next. A little wildness sometimes works wonders--even in the rigorous realms of scientific thought. Curiosity itself is a kind of wildness of the mind. Moreno, the Prophet of Spontaneity, is a little wild. Lundberg, the Sociological Bull of Bashan, is as wild as the pampas. What could be wilder than for the man of 1900 to envisage the role of air power in the present war? (Many

admirals and generals have not yet envisaged it correctly.) My father would have thought he was losing his mind if he could have thought of a "good" woman smoking cigarettes, cutting her hair and dresses short, and taking a little snifter now and then. Twenty-five years ago, only a few wild men could conceive a natural science of sociology; they were prophets in Israel whose stone, at first rejected, is now rapidly becoming the head of the corner.

The man who lets his mind run free, and even a little wild, will certainly be wrong most of the time, and even foolish, but some men, sometimes, light fires that burn and illumine dark crannies in this Mammoth Cave which is the world; lights that dispel the age-old mists of mysticism that have clouded the creative mind of man; heat that warms the chilly cockles of the heart.

A little wildness now and then
Might profit professorial men.

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